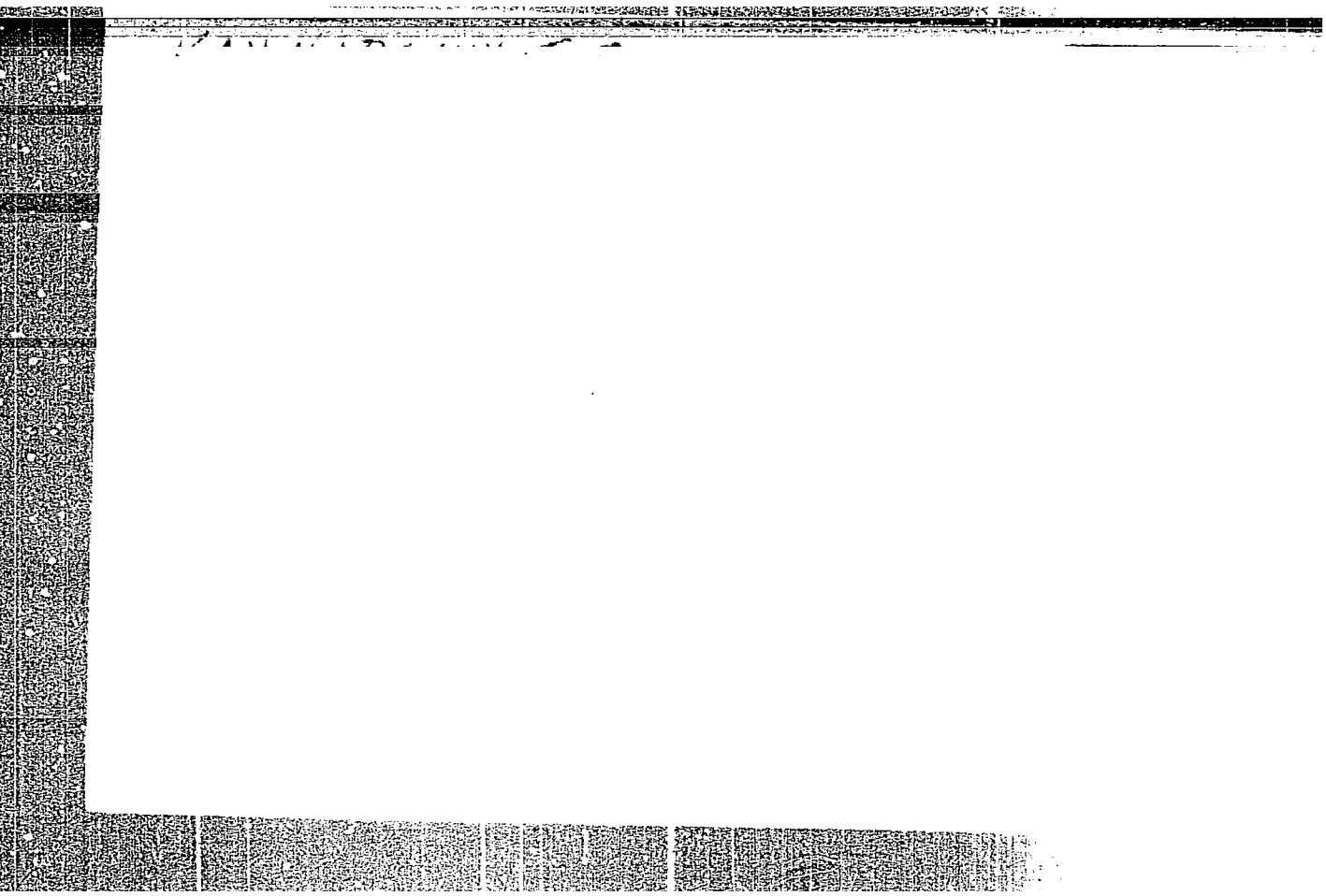

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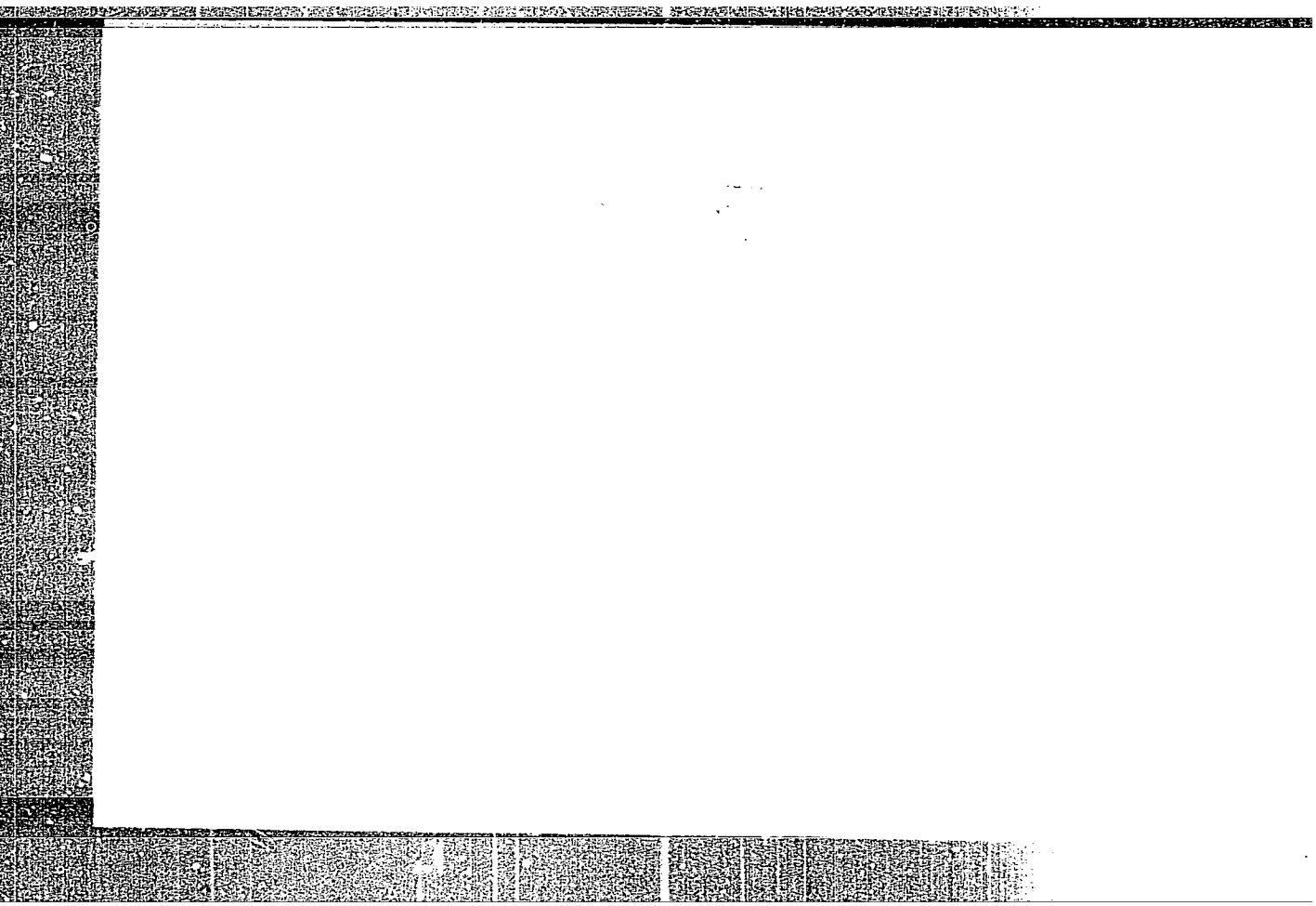

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KAYNARSKIY, I. S.

USSR.

Chemical-mineralogical studies on acidic fettling sinters of open-hearth furnaces. I. S. Kainarskii and L. I. Karyakin. *Voprosy Petrog. i Mineral., Akad. Nauk S.S.S.R.* 2, 330-41(1953).—Sands from Lyuberetsk and Millerovsk are examd. in different forms of fettling soles for the open hearth. A characteristic zoning is observed: (a) an obsidian-like, entirely glassy product contg. 97.5% SiO_2, (b) densely sintered, zonal glass layers, partly highly siliceous, but devitrified to cristobalite and high in open pores; (c) entirely "exhausted" sand sinter, impregnated with fayalite, bustamite, magnetite, some α-$CaSiO_3$, etc. Open porosity in (b) is particularly important because the aggressive melts easily penetrate into the fettling sole by these pores and cracks. SiO_2 glass generally shows such an open porosity, increasing with increasing devitrification to cristobalite, although the glass had initially no porosity at all. Entirely slagged fettling sinters with only 71% SiO_2 contain much less cristobalite but more magnetite, fayalite, and bustamite, derived from the open-hearth slag. An extensive description is given of the minerals observed in the sand sinters mentioned above. Residual quartz and occasional tridymite (with characteristic twins) have the normal physiographic properties, but cristobalite is distinguished in 3 morphological modifications: as a scaly, an acicular, and an irregularly aggregated "metacristobalite" (cf. D. S. Belyankin and N. G. Kaznakova, C.A. 42, 5169f). Excellent paramorphs of cristobalite after quartz and tridymite are observed.

W. Eitel

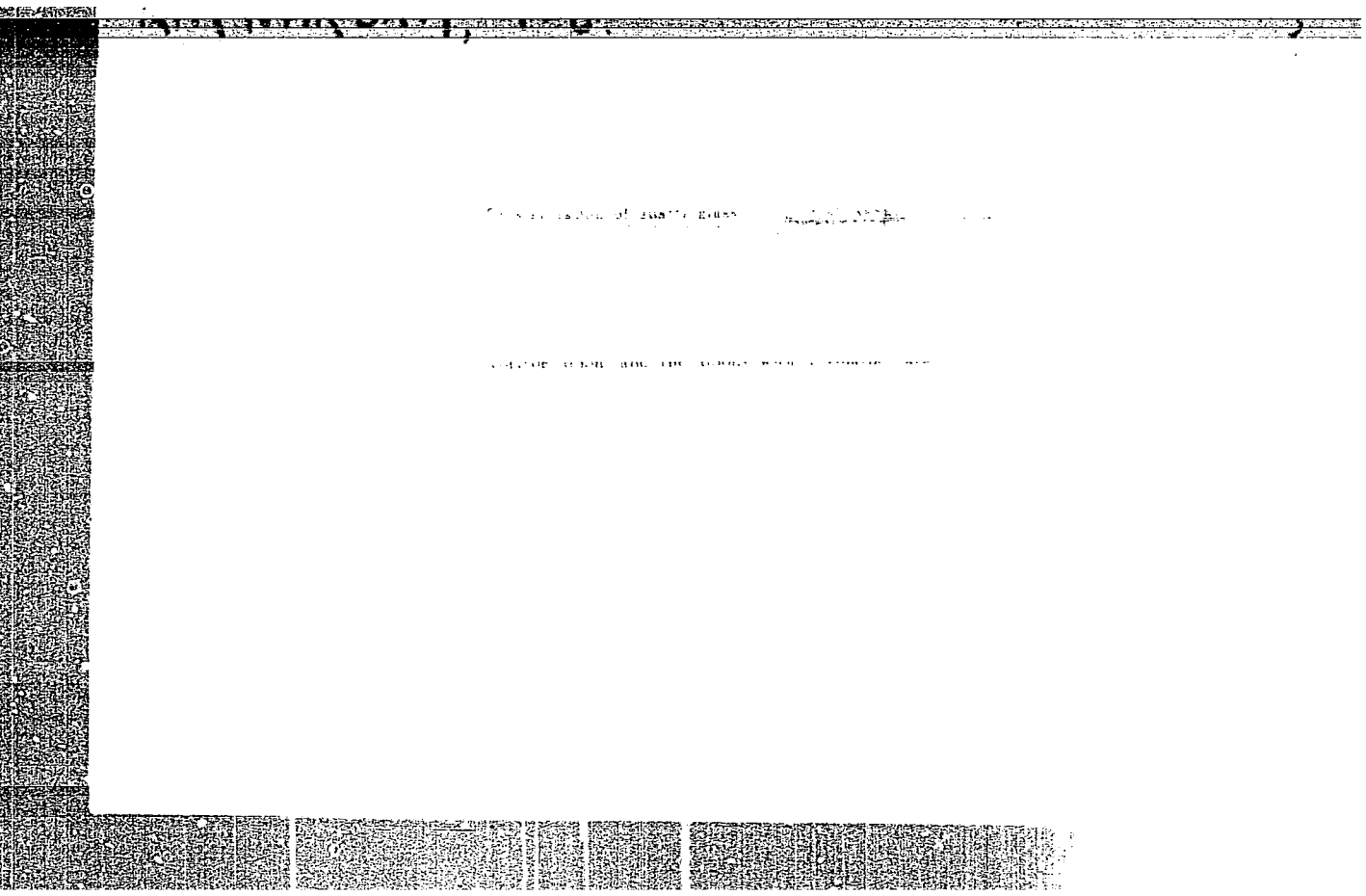
KAYNARSKIY, I.S., prof., doktor; TSIGLER, V.D., inzh.; SIDORENKO, Yu.P.; KALYUZHNYY, P.T.

Service of lightweight dinas bricks in a dinas-burning periodic kiln. Ogneupory 18 no.4:163-172 Ap '53. (MIRA 11:10)
(Firebrick) (Kilns)

KAYNARSKIY, I.S., prof., doktor; TSIGLER, V.D., inzh.; STOVBUR, A.V., inzh. SIDORENKO, Yu.P.; KALYUZHNYY, P.P.

Organizing the production of lightweight dinas bricks. Ogneupory 18 no.7:291-300 Jl '53. (MIRA 11:10)

1.Khar'kovskiy institut ogneuporov (for Kaynarskiy, TSigler, Stovbur).
2.Dinasovyy zavod im. F. Dzerzhinskogo (for Sidorenko, Kalyuzhnyy).
(Firebrick)



KAYNARSKIY, I.S., prof. doktor.; GAVRISH, D.I., inzh.; PINDRIK, B.Ye.; KUDRYAVTSEV, S.N.

Mastering the production of high-density, high-alumina dinas bricks. Ogneupory 19 no. 3:128-135 '54. (MIRA 11:8)

1. Pervoural'skiy dinasovyy zavod i Khar'kovskiy institut ogneuporov. (Firebrick)

USSR

Formation of rounded aggregates from gaseous phases. I. I. Karyakin and I. S. Kalnovskii. *Zapiski Vsesoyuz. Mineralog. Obshchestva* 83, 242-5(1954).—By the heterogeneous gas reaction of SiO_2 with reducing flame gases, in which SiO is formed as intermediate product, at 1410°, a deposition of cristobalite on the refractory linings of an industrial furnace was observed. It shows characteristic club-shaped, rounded, or sintered structures, and needles of a peculiar development. Most of the material is β-cristobalite and some SiO_2 glass (lechatelierite); evidently, the cristobalite is crystd. from this glass. Often spherulitic aggregates and "clubs" show in the central parts transparent, in the exterior layers a white-opaque and porous, cristobalite. The n of glass is 1.460, of the cristobalite $\gamma = 1.487$; $\omega = 1.485$. The genesis of the SiO_2 deposits is typically pneumatogenic.

W. Eitel

USSR/Chemistry - Chemical technology

Card 1/1 Pub. 22 - 31/40

Authors : Kaynarskiy, I. S., and Degtyareva, E. V.

Title : Effect of mineralizers during tridymitization of silica and criteria for the evaluation of the mineralizers

Periodical : Dok. AN SSSR 99/2, 301-304, Nov 11, 1954

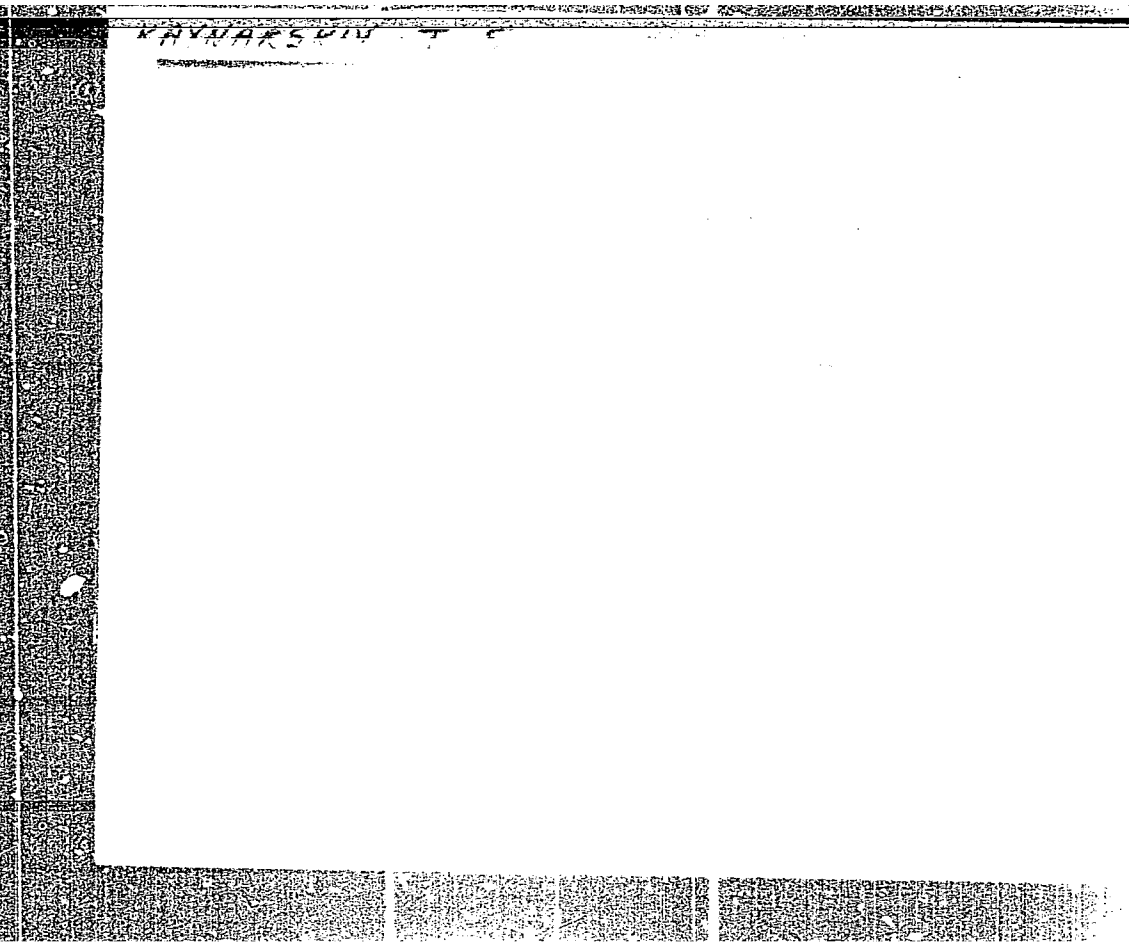
Abstract : The effect of mineralizers, during the conversion of SiO_2 into tridymite (crystalline form of silica), was investigated. It was found that the mineralizer (Na_2O) not only affects the kinetics of the conversion, but is instrumental in the conversion itself. Ways of obtaining a high degree of tridymitization of silica are described. Temperature increases intensify the process of conversion mainly as result of acceleration of the diffusion processes. Eighteen references: 2-USA and 16-USSR (1913-1954). Tables.

Institution : All-Union Scientific Research Institute of Refractories, Kharkov

Presented by: Academician N. V. Byelov, August 2, 1954

USSR.

2308. Light-weight silica from quartz sand.—I. S. KAINARSKII and S. L. LESNICHENKO (*Glass & Ceramics*, Moscow, 12, No. 4, 27, 1955). In the production of lightweight silica refractories by the method of adding a combustible, a finely ground (< 0·5 mm.) quartzite is used in Russia. It is suggested that a fine quartz sand may be used instead. With a ratio of natural and finely ground sand of 4 : 1, silica products can be obtained with a bulk density of 68–75 lb/cu.ft. and crushing strength of 285 lb/sq.in. The combustible can be anthracite, coke, sawdust, etc. The bond was 2·5% of slaked lime (calculated as CaO) and 1% of sulphite lye. Increasing the ratio of fine sand to 3 : 2 (from 4 : 1) considerably increases crushing-strength. Lightweight silica bricks made by casting had a density of 65–67 lb/cu.ft., a crushing strength of 430–1,140 lb/sq.in., a refractoriness of 1,720° C. and a refractoriness under load (14 lb/sq.in.) of 1,670° C. (2 figs., 6 tables.)



KAYNARSKIY, I. S.

USSR /Chemical Technology. Chemical Products and Their Application I-12

Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31575

Author : Karyakin L.I., Kaynarskiy I.S.

Title : Performance of Dinas Brick in a Tank Furnace for the Production of Heat-Resistant Glass

Orig Pub: Ogneupory, 1955, No 4, 159-165

Abstract: Data are reported on chemical and mineralogical composition of Dinas bricks (D) A and B, taken, respectively, from the burner vaults and the skewback of melting compartment of a continuous operation tank furnace, after 16 months of operation. The furnace was used to produce alkali-free alumo-borosilicate glass (ABG); air preheating

Card 1/2

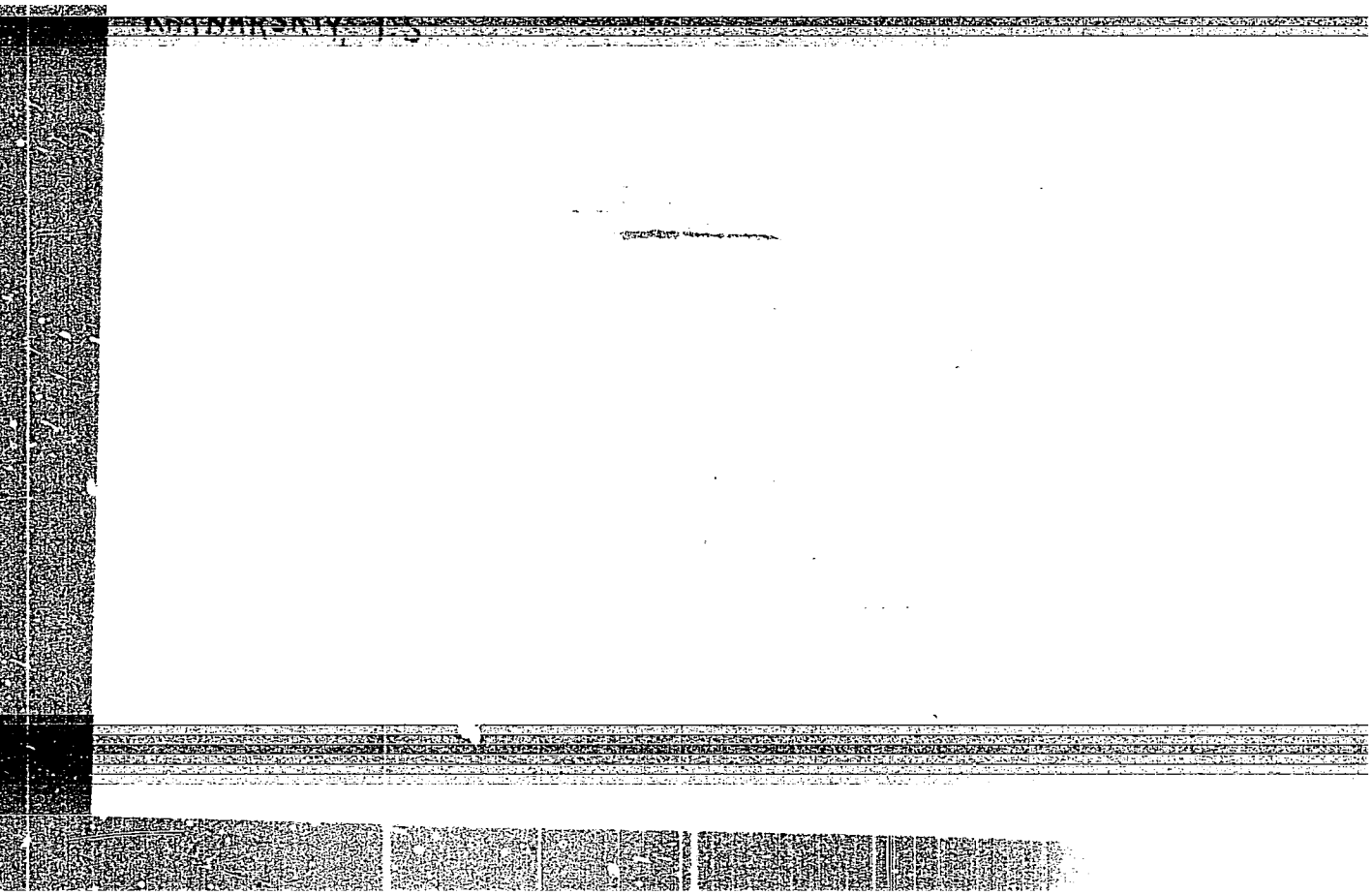
USSR /Chemical Technology. Chemical Products and Their Application I-12

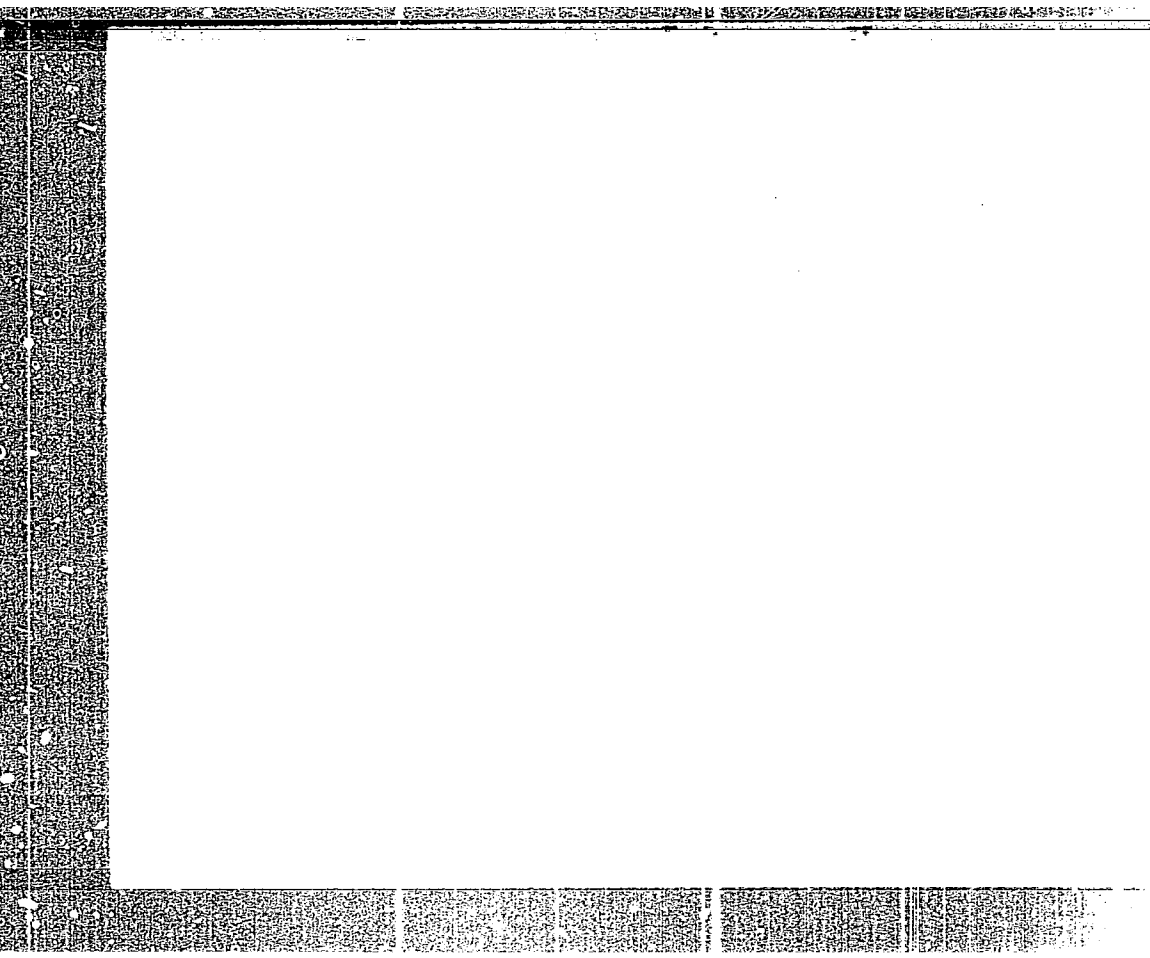
Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31575

temperature was 800-900°, temperature in working area, within the zone of flame, was 1550-1590°. The slight wear of the investigated D in the upper structure of the furnace (10-30 mm) and the experimental use in this furnace, in lieu of vitrified quartz blocks, of ordinary D at individual portions of the tank, support the assumption that in lining the walls and bottom of the melting portion of the tank, for the production of ABG, it is advantageous to use special, high-density, high-silica content D, in lieu of vitrified quartz blocks.

Card 2/2





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SOV/137-58-11-21913

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 11, p 11 (USSR)

AUTHORS: Kaynarskiy, I.S., Tsigler, V. D.

TITLE: Using Lightweight Silica Brick in Industrial Furnaces (Primeneniye legkovesnogo dinasa v promyshlennykh pechakh)

PERIODICAL: Byul. nauchno-tekhn. inform. Vses. n.-i. in-t ogneuporov, 1956, Nr 1, pp 94-111

ABSTRACT: A description is offered of a long-term experiment in the utilization of lightweight silica brick in the lining of reheat furnaces (F) in the rolling and forge departments of metallurgical and machinery-manufacturing plants, and in periodic, box-type gas, ring, and tunnel F at refractories plants. Recommendations are advanced for particular design components of F which the accumulated experience indicates should be laid of lightweight silica brick.

Ya. G.

Card 1/1

15-57-7-9473

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 7, p 107 (USSR)

AUTHORS: Kaynarskiy, I. S., Orlova, I. G.

TITLE: Changes in the Silica System (Prevrashcheniya v sisteme kremnezema)

PERIODICAL: V sb: Fiz.-khim. osnovy keramiki. Moscow, Promstroyizdat, 1956, pp 507-519

ABSTRACT: Bibliographic entry

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USSR /Chemical Technology. Chemical Products and Their Application I-12

Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31551

(pH of slip). On the basis of these investigations practical recommendations are made concerning the use of electrophoresis in the forming of articles from fine-ceramic pastes.

Card 2/2

KAYNARSKIY, I.S.

USSR /Chemical Technology. Chemical Products and Their Application I-12

Silicates. Glass. Ceramics. Binders.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31554

Author : Kaynarskiy I.S., Piven' I. Ya.

Inst : Khar'kov Polytechnic Institute

Title : Adsorbent Additives as Porosity Reducers in Moldings of Mineral Powders

Orig Pub: Tr. Khar'kovsk. politekhn. in-ta, 1956, 8, 191-193

Abstract: An analysis of the effects of adsorbent additives on porosity of moldings made from mineral powders (technical alumina, corundum, burnt clay,

Card 1/2

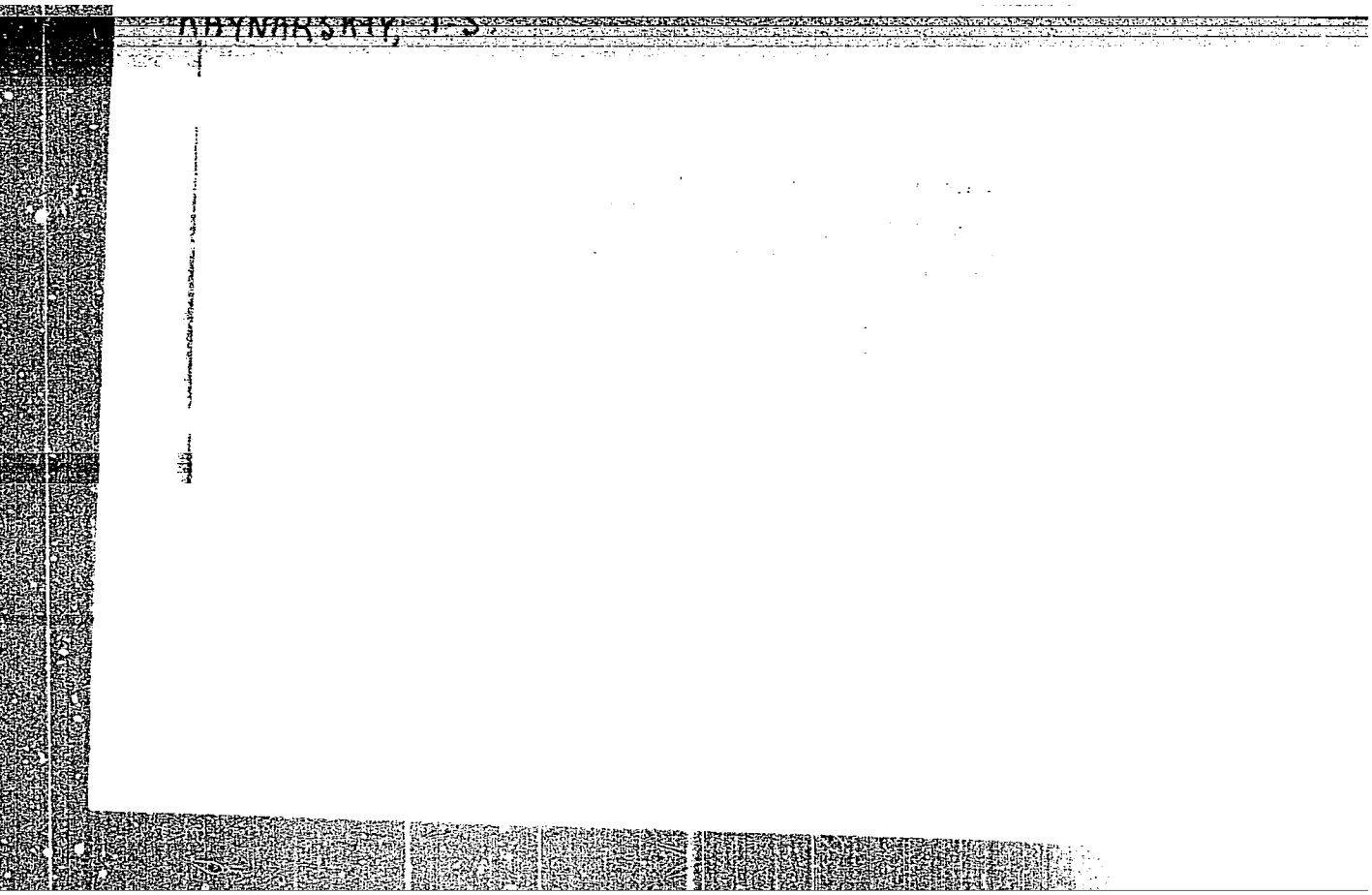
USSR /Chemical Technology. Chemical Products and Their Application I-12

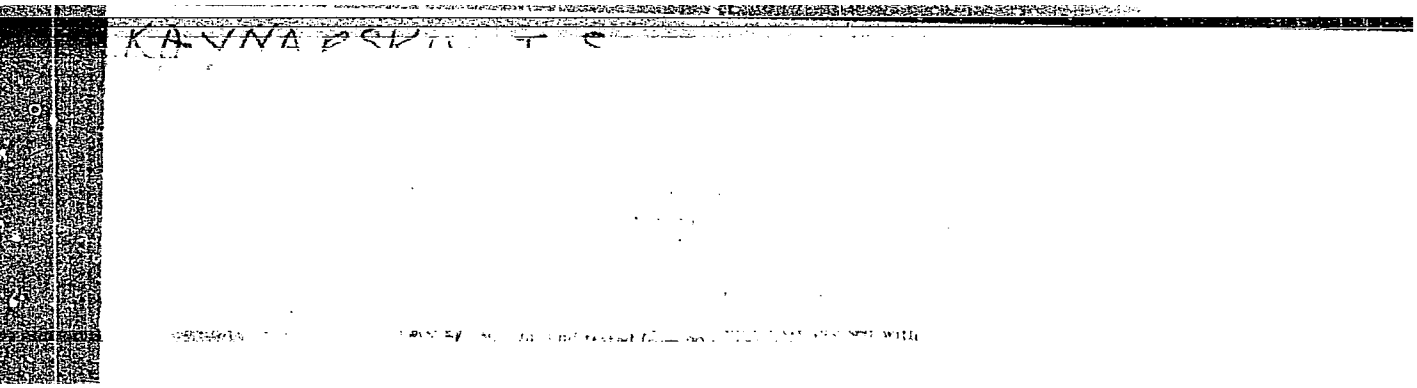
Silicates. Glass. Ceramics. Binders.

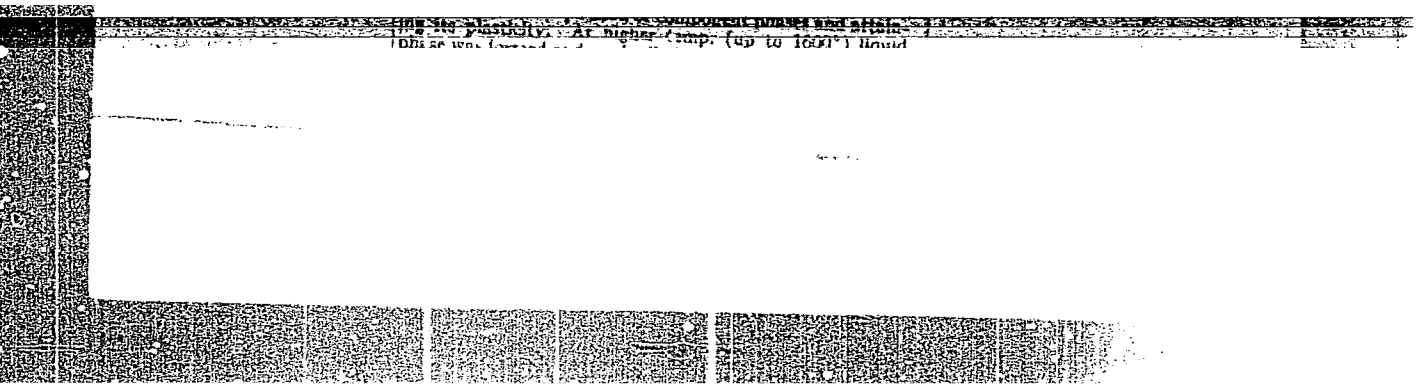
Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31554

dolomite, magnesite). It is noted that use of adsorbent additives results in higher density of packing and is specifically correlated with chemical composition of these additives and the mineralogical composition of the press-worked mineral powders.

Card 2/2







KAYNARSKIY, I. S.

137-1958-2-2292

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 12 (USSR)

AUTHORS: Kaynarskiy, I.S., Orlova, I.G.

TITLE: Phase Transformation of Silica (Prevrashcheniya v sisteme kremnezema)

PERIODICAL: V sb.: Fiz.-khim. osnovy keramiki. Moscow, Promstroyizdat, 1956, pp 507-519

ABSTRACT: This is a survey of the latest information on the transformations of SiO_2 at high temperatures into tridymite, cristobalite, quartz glass, etc. Included are data obtained by the Authors on the "cristobalitizing" effect of different cations on finely divided quartz and on the "tridymitization" of SiO_2 as a function of the nature of the raw material involved and of various other factors. Bibliography: 41 references. S.G.

1. Silica—Transformation 2. Silica—Temperature effects

Card 1/1

KAYNARSKIY I.S.

KAYNARSKIY, I. S. 137-1958-3-4585

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 17 (USSR)

AUTHORS: Kaynarskiy, I. S., Degtyareva, E. V.

TITLE: The Investigation and Improvement of the Properties of Light-weight Dinas Brick (Issledovaniye i uluchsheniye svoystv legkovesnogo dinasa)

PERIODICAL: Byull. nauchno-tekhn. inform. Vses. n.-i. in-t ogneuporov, 1957, Vol 2, pp 53-72

ABSTRACT: An investigation of changes in properties of light-weight dinas (LD), manufactured from Ovruch quartzite (with grains not exceeding 1 mm) and ground coke dust (with grains not exceeding 3 mm) with the composition of the charge, changes in the grain-size composition of quartzite and coke dust, and changes in the composition of the mineralizers CaO+ FeO). It is established that increasing the coke-dust content in the charge, increasing the size of the fine fraction of quartzite from a grade < 0.06 mm to a grade < 0.088 mm, and utilizing CaO in the binder material (without introducing FeO), produces an increase in the porosity of the LD and reduces its volumetric weight. The research yielded an experimental LD of a volumetric weight of 1.28 - 1.36

Card 1/2

The Investigation and Improvement of the Properties (cont.)

g/cm^3 a specific gravity of 2.35 - 2.36 kg/cm^2, a $\sigma_{b\,compr.}$ of 150-192 kg/cm^2 and a coefficient of thermal conductivity equal to 0.53 - 0.75 kcal/m·degree·hr (at an average temperature of 300°). The shear modulus of the LD, at temperatures below 1000°, may be reduced, while its heat resistance may be raised by means of increasing the coke-dust content, reducing the size of its grains, and employing additives which are devoid of Fe oxides. The Dzerzhinskiy dinas plant produced an experimental series of hollow LD (with sealed circular openings) with a 17 percent cavity. Volumetric weight of this hollow LD is 0.99 g/cm^3, i.e., it is 20 percent lower than that of the solid LD. The hollow LD may be effectively employed for periods >16 months in the lining of gas-fired chambers of furnaces used in the sintering of dinas.

S. G.

Card 2/2

SOV/137-59-1-53

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 7 (USSR)

AUTHORS: Kaynarskiy, I. S., Degtyareva, E. V.

TITLE: New Types of Silica and Carborundum Refractories (Novyye tipy dinasovykh i karborundovykh ogneuporov)

PERIODICAL: V sb.: Materialy soveshchaniya po vopr. raboty pechey tsvetn. metallurgii i razvitiya pirometallurg. protsessov. Moscow, 1957, pp 463-476

ABSTRACT: A description is made of the properties of silica brick (S) and factors affecting its stability. To increase the stability of S VNIIO (All-Union Scientific Research Institute of Refractories) has developed a high-density, high-silica S (its physicochemical properties are adduced) containing 2 - 3.5% more silica, which fact increases its resistance to chemical attack; it has 50% less porosity which decreases its capacity for absorbing the melt. Its maximum safe temperature is 20 - 30°C higher than that of the common S brick. The character and properties of light-weight refractories are adduced, including those of light-weight S manufactured by the method of burned-out additives. A description is given of light-weight S developed at the

Card 1/2

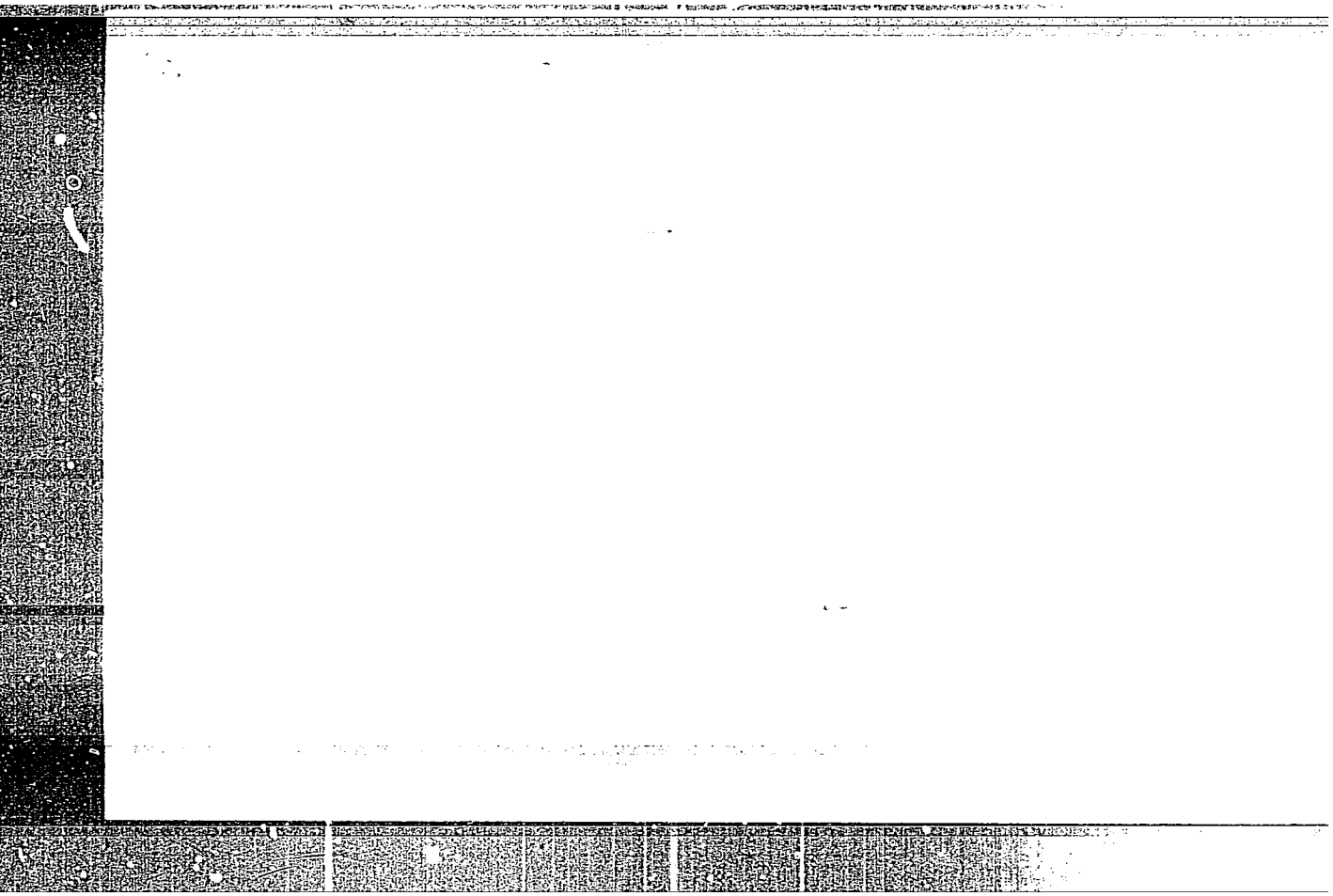
SOV/137-59-1-53

New Types of Silica and Carborundum Refractories

VNIIO with mechanical strength of 100 kg/cm^2 and volumetric weight of 1.3 - 1.35 g/cm^3, also of hollow light-weight S. Their range of applicability is given. Properties of carborundum refractories and the effect of various factors thereon are adduced. With a view of improving the quality of carborundum refractories, VNIIO developed a new superhigh-grade type of dense carborundum refractory, manufactured of 100% industrial carborundum without mineral additives, by either the plastic or the semi-dry method. Findings of investigations of the oxidizability of carborundum refractories are described.

Yu. O.

Card 2/2



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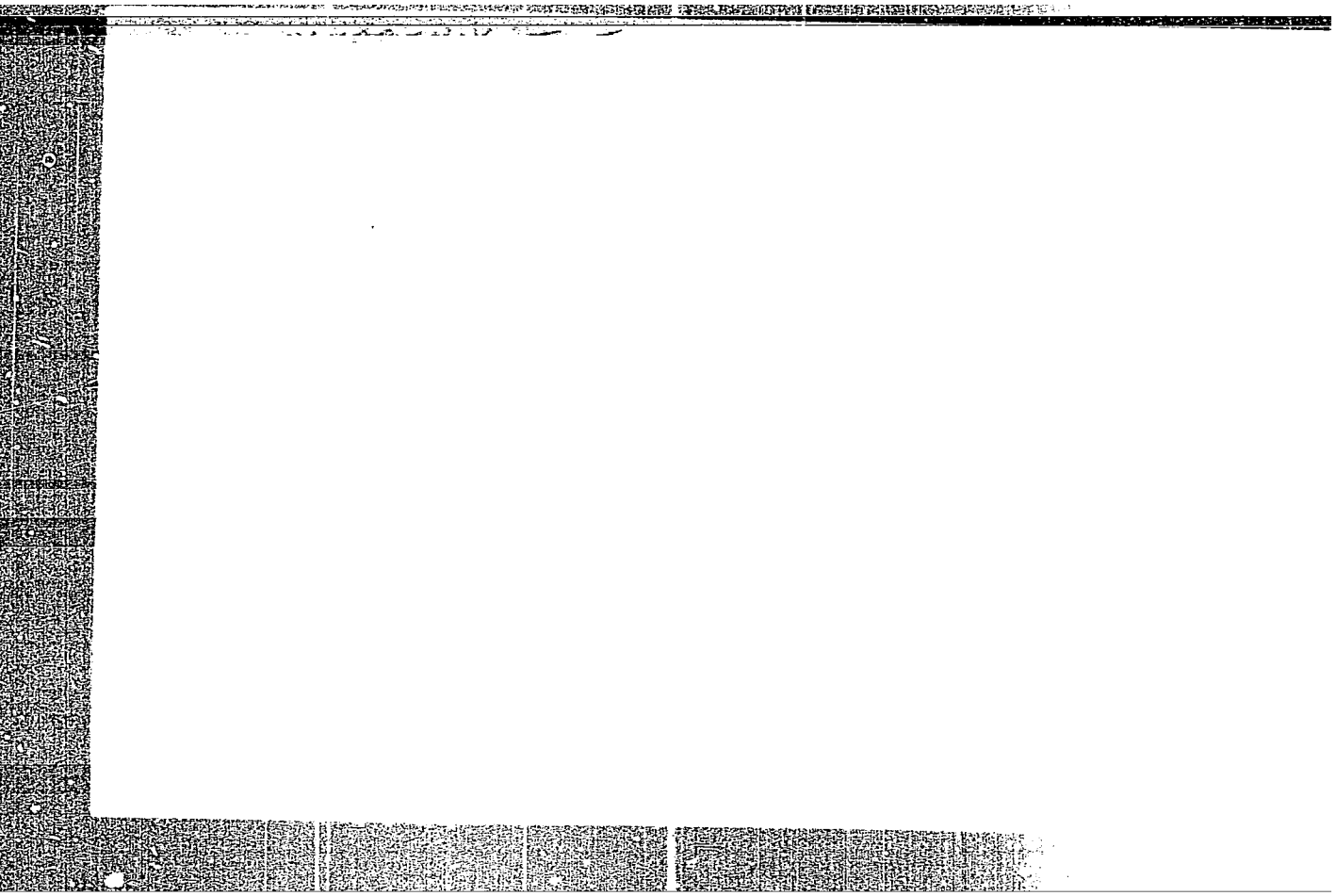

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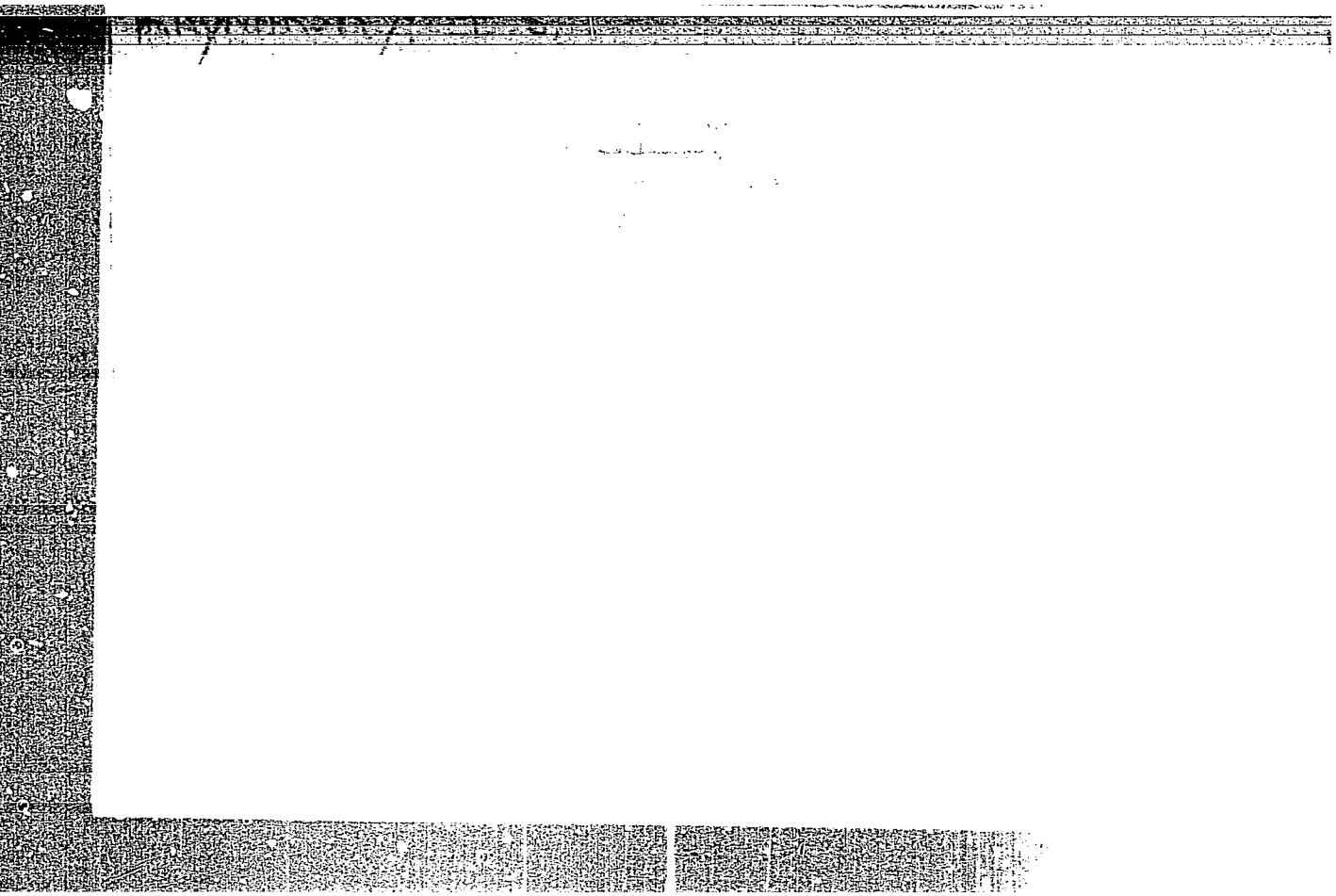
KAYNARSKIY, I.S.; SHAVROVA, Ye.B.

Modulus of elasticity in dinas bricks and its dependence on basic technological factors. Ogneupory 22 no.6:241-249 '57. (MLRA 10:7)

1. Khar'kovskiy politekhnicheskiy institut im. Lenina.
(Firebrick--Testing)



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KAYNARSKIY, I.S.

82146

SOV/81-59-6-20197

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 6, p 359 (USSR)

15.2210

AUTHORS: Kaynarskiy, I.S., Degtyareva, E.V.

TITLE: Investigation and Improvement of the Properties of Light-Weight Dinas

PERIODICAL: Byul. nauchno-tekhn. inform. Vses. n.-i. in-t ogneuporov, 1957, Vol 2, pp 53 - 72

ABSTRACT: A light-weight Dinas with $\sigma_{compr.}$ = 150 kg/cm^2, volumetric weight = 1.3 g/cm^3 and a coefficient of heat conductivity by 2-2.5 times lower than that of common Dinas was obtained by selecting the grain composition of quartzite, the quantity and the grain composition of the burning-out addition (BA) (coke fines), and the amount and the composition of the mineralizer. The shear module of light-weight Dinas decreases with an increase in the BA content, refinement of the grain composition of BA and quartzite, a decrease in the amount of the mineralizer and the replacement of the iron-lime binding material by lime binding material. An additional decrease of the volumetric weight of light-weight Dinas (up to 25%) can be obtained by manufacturing hollow products from it.

Card 1/1

T. Ryakhovskaya

KAYNARSKIY, I. S.

AUTHORS: Kaynarskiy, I.S., Pindrik, B.Ye., Bovkun, S.S., Sidorenko, Yu.P., Chudnovskiy, A.M. 131-12-1/9

TITLE: Production (Proizvodstvo) The Organization of Dinas Chromite Production (Organizatsiya proizvodstva dinasokhromita)

PERIODICAL: Ogneupory, 1957, 22 Nr 12, pp. 529-533 (USSR)

ABSTRACT: Before current production was organized a set of test samples was put together, the composition and method of production of which is described in detail. The raw material was dried in a tunnel drying plant and then pressed. The dinas chromite was burnt in gas chamber kilns according to the regime for Martin dinas at 1425-1445°. The results of sorting out showed that dinas chromite can be burnt according to the regime of Martin dinas. Furthermore, the chemical composition, the porosity, the pressure- and breaking strength, refractoriness, permeability to gas, heat conductivity, and the specific heat are given. In table 1 a comparison is drawn between dinas chromite and dinas with respect to slag erosion. The illustration shows the curves of heat expansion of dinas chromite at various temperatures. Further results of microscopical investigations of the structure are given. From all results mentioned above it may be seen that, with respect to its properties, dinas chromite is very similar to dinas, but that

Card 1/2

Production. The Organization of Dinas Chromite Production 131-12-1/9

it is distinguished by a greater resistance against slag at moderate temperatures. For current industrial production the technological process was precisely described, and the best working conditions were provided, which are described in detail. Table 2 shows the burning temperatures. The physical-ceramical properties of dinas chromite are shown in table 3. The results obtained by the investigation of three complete sets of current production may be seen from table 4. In conclusion it is said that the production of dinas chromite presents no difficulties and requires no additional equipment: it can be carried out in any dinas plant. There are 1 figure, 4 tables, and 2 Slavic references.

ASSOCIATION: Khar'kov Institute for Refractories (Khar'kovskiy institut ogneuporov) The Dinas Factory imeni Dzerzhinskiy (Dinasovyy zavod imeni Dzerzhinskiy).

AVAILABLE: Library of Congress

Card 2/2

KAYNARSKIY, I. S. and I. G. ORLOVA

"Relationship Between the Physicochemical Properties of Equivalent Melts and Quartz Tridymitisation" p. 359

~~"Synthesis and Structure of [illegible] Simple and Complex Heavy Metal Cations," p. [illegible]~~

Transactions of the Fifth Conference on Experimental and Applied Mineralogy and Petrography, Trudy ... Moscow, Izd-vo AN SSSR, 19[illegible], [illegible]

reprints of reports presented at conf. held in Leningrad, [illegible] Mar 1956. The purpose of the conf. was to exchange information and coordinate the activities in the fields of experimental and applied mineralogy and petrography, and to stress the increasing complexity of practical problems.

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SOV/81-59-5-16196

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 5, p 355 (USSR)

AUTHORS: Kaynarskiy, I.S., Vasil'yeva, K.F.

TITLE: The Production Technology of High-Quality Carborundum Refractories

PERIODICAL: Sb. nauchn. tr. Vses. n.-i. in-ta ogneuporov, 1958, Nr 2 (49), pp 319 - 355

ABSTRACT: The possibility was investigated of improving the properties (density, gas-permeability, stability under a load at high temperatures, thermal conductivity) of carborundum refractories (CR) with a 85 - 100% carborundum content in the charge. Commercial black and green carborundum with the following fractions according to the grain size were used: Nr 36 with a 92% content of 0.6 - 0.4 mm grains, Nr 60 with 87% of 0.3 - 0.2 mm grains, and Nr 100 with 93% of 0.2 - 0.1 mm grains. A characteristic is given of the mineral admixtures (commercial alumina, Chasov-Yar clay, bentonite, talc), which were ground to a grain size of < 0.083 mm. A dense raw material is obtained from a fine-grain carborundum mass in the case of introducing a part

Card 1/2

80627

SOV/81-59-5-16196

The Production Technology of High-Quality Carborundum Refractories

of extremely fine fractions of the carborundum ($\leq$ 0.06 mm) into the mass. The content of large and fine grains in the mass should be 40 - 50%, of medium-sized 10 - 20%. CR are obtained with an alumina admixture as well as with an admixture of Al_2O_3 in an α - and γ-form or in the form of a mixture of clay and commercial alumina. CR were also obtained from commercial carborundum without introducing mineral admixtures with very high characteristic features. The Refractory Materials Plant im. Ordzhonikidze in the city of Chasov-Yar has been producing CR without mineral admixtures since 1956.

I. Mikhaylova

Card 2/2

AUTHORS: Kaynarskiy, I. S., Orlova, I. G. 78-3-6-21/30

TITLE: Somes Rules Governing the Crystallization of Silicate Melts (Nekotoryye zakonomernosti kristallizatsii silikatnykh rasplavov)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 6, pp. 1416-1427 (USSR)

ABSTRACT: The crystallization of Silicate Melts is of great scientific and practical interest. The mechanism of crystallization from the silicate melt is, in principle, similar to the crystallization from the solutions. The complicated character of the various acid silicon radicals renders silicate crystallization difficult. Various acid silicate anions of complicated structure are formed in the silicate melts which also make crystallization difficult. Dissociated as well as undissociated silicate compounds which injure the structure of the formed crystallites, are formed in the silicate melts. The properties of the silicate melt are characterized by the ratio of O : Si.

Card 1/3

The various cations formed in the melt also impair the stability of the anion-complexes of silicon. Especially Al^{3+}, P^{5+}, B^{3+} and others may be mentioned as complex-forming cations.

Synthetic melts were produced for the investigation of the rules governing the crystallization of the silicate melt. The synthetic melts were selected in a composition in which the ratio O : Si fluctuates within a relatively large interval.

The following melts were investigated: Na_2O-SiO_2, MnO-SiO_2, Na_2O-CaO-SiO_2, Na_2O-MgO-SiO_2, CaO-MgO-SiO_2 and CaO-FeO-SiO_2.

On the strength of the phase diagrams, mainly tridymite and various silicates are formed in all investigated melts of the crystallization.

The phases which were formed from the melt with the crystallization of silicates, differ substantially from the

phase diagram of the corresponding systems.
The crystallized phases from the silicate melt are characterized by the ratio between the atomic quantity of oxygen and silicon.
Knowing this ratio, conclusions may be drawn with respect to the products obtained by crystallization from the silicate melt. The phase diagrams of silicate melts cannot be applied, however, with the crystallization of technical silicate melts on account of the complicateness and the different composition.
There are 1 figure, 4 tables, and 52 references, 43 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut ogneuporov (Scientific Institute for Refractory Materials)

SUBMITTED: April 13, 1957

AVAILABLE: Library of Congress
1. Silicate melts--Crystallization--Standards

KAYNARSKIY, I.S.; MALINOVSKIY, K.B.

Electrophoresis as method of molding fine ceramic wares. Stek. i ker. 15 no.4:26-30 Ap '58. (MIRA 11:5)

1. Khar'kovskiy politekhnicheskiy institut imeni Lenina.
(Pottery) (Electrophoresis)

SOV/81-59-9-32080

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 9, p 357 (USSR)

AUTHOR: Kaynarskiy, I.S.

TITLE: Increase in the Abrasion Resistance of Dinas Brick

PERIODICAL: Tr. Khar'kovsk. politekhn. in-ta, 1958, Vol 17, pp 219 - 224

ABSTRACT: The effect of individual technological factors on increasing the abrasion resistance of Dinas brick has been investigated. It has been established that for the manufacture of Dinas brick with a high abrasion resistance, dense quartzites should be used with a predominant content of grains of < 0.088 mm in the fine fraction (< 0.5 mm). The increase in the abrasion resistance of Dinas brick is attained by the introduction of additions (Fe oxides or Mn oxides togehter with Ca oxide in the ratio 3:1) or by burning at sufficiently high temperatures and long exposure which ensures an intensive sintering of the basic mass and its tridymitization. One of the principal technological factors affecting the increase in the abrasion resistance of Dinas brick is an increase in the extrusion pressure of the raw bricks from 250 to 1,000 kg/cm^2.

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G. Maslennikova

131-1-5/14

AUTHORS: Kaynarskiy, I. S. , Sidorov, N. A.

TITLE: Ganite and Its Refractory Properties (Ganit i yego ogneupornyye svoystva)

PERIODICAL: Ogneupory, 1958, V.23 Nr 1, pp. 19 - 23 (USSR)

ABSTRACT: Among the interesting refractory materials are various spinels, in their number the zinc-aluminiferous spinel-ganite with a melting temperature of about 1950°C. Its synthesis was investigated in detail and does not represent any difficulties, it quantitatively takes place at comparatively low temperatures of 1200°C. Test samples of two types were produced: some of a layer of 75 % ganite--fireclay and 25 % synthetic ganite, others of 25 % ganite-fire--clay and 75 % synthetic ganite. The test samples were pressed under a pressure of 1000 kg/cm^2 and burned at 1550°C for 4 hours and possessed a porosity of 9 - 10 %, as well as a spatial shrinkage of 20 %. The refractoriness of ganite (according to GOST 4069--48) was determined by means of pyroscopes formed of it. A destruction of the test samples was not observed (table 1). In case that the sintering is improved at the expense of a more intensive burning, no deformation occurs at 1700°C (table 2). Table 3 shows the thermal stability of the ganite samples. The tested oxides (see

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table 4) may, after their action upon ganite, be divided into two groups: NiO, CoO and MgO - which do not destroy ganite, as well as SiO_2, MnO_2, PbO, CaO and Fe_2O_3 + FeO (scale) which act destructively. The resistance of ganite to the influence of slags is given in table 5. Conclusions: well-sintered ganite endures a load of 2 kg/cm^2 at 1700°C; ganite can be used in an oxidation atmosphere up to a temperature of 1500°C; it may also serve as lining of electric furnaces; it can be used for melting Al, Zn, Pb and Sn. With a resistance to pressure of 8000 - 8500 kg/cm^2, bending strength of 450-550 kg/cm^2 and a Rockwell hardness of 55 - 85 ganite can be used as base in the strength test of refractory materials at high temperatures. There are 5 tables, and 5 references 4 of which are Slavic, and 1 English.

ASSOCIATION: Polytechnic Institute imeni V. I. Lenin, Khar'kov
(Khar'kovskiy politekhnicheskiy institut im. V. I. Lenina)

AVAILABLE: Library of Congress

1. Refractory materials-Properties

KAYNARSKIY, I. S.

AUTHORS: Yeltysheva, A.A., Kaynarskiy, I.S. 131-3-7/16

TITLE: On Processes Taking Place During the Heating of Dinas Brick Clay and Their Connection With the Modification of Its Strength (O protsessakh pri nagrevanii dinasovogo syrtsa i ikh svyazi s izmeneniyem yego prochnosti)

PERIODICAL: Ogneupory, 1958, Vol 23, Nr 3, pp 118-131 (USSR)

ABSTRACT: The improvement of the quality of dinas depends upon the action brought to bear upon the physical-chemical processes during burning. As raw material quartzite found at the Ovruch deposit was used for the experiment; its composition is given as also the preparation of the masses. The pressure breaking strength of dinas raw material in the heated state was measured on the apparatus of the VNIIO (fig. 1). Fig. 2 shows the influence exercised by granular composition, pressure, the addition of dinas scrap instead of quartzite, and, for reasons of comparison, the raw material obtained from the mass of the plant imeni Dzerzhinskiy. Table 1 shows the influence exercised by the composition and the amount of additions, and table 2 gives the characteristic of the production output of

Card 1/4

the plant imeni Dzerzhinskiy. By means of an apparatus of the VNIIO, which was developed by B.Ya. Pines, the bending-tensile strength of dinas raw material was determined at different temperatures. Results may be seen from table 3. Table 4 shows the change of shearing strength when the dinas raw material is heated. The linear extension of the raw material by heating is shown by fig. 3, viz. under the influence of granular composition and the addition of dinas scrap instead of quartzite; extension in various temperature intervals is shown in table 5. The binding of calcium oxide by siliceous earth by dry mixing of masses with following burning may be seen from table 6, and by wet mixing from table 7. Losses caused by burning off are shown in fig. 4. The change of the pressure breaking strength of the raw material of veined quartz produced without any additions by heating is shown in table 8. Thermograms of mixtures of quartzite and $Ca(OH)_2$ both in the case of wet and dry mixing of the masses, as well as of the quartzite found at the Ovruch deposit and of $Ca(OH)_2$ may be seen from fig. 5. The dependence of the decrease of the strength of raw material during the

temperature interval of 800-1000° on the formation of cristobalite may be seen from fig. 6, and dto. in the temperature interval of 1300-1400° from fig. 7.

Conclusions:

1.) By heating the pressure strength of dinas raw material changes as follows within 5 temperature intervals:
   - Reduction of strength: 20 - 600°
   - Considerable increase of strength: 600 - 800°
   - Reduction of strength: 800 - 1000°
   - A very sharp increase of strength: 1000 - 1300°
   - Reduction of strength: 1300 - 1400°

2.) The change of the strength of the heated raw material is due to several physical and chemical processes.

3.) Different technological factors influence processes during the 5 temperature intervals in different ways.

On Processes Taking Place During the Heating of Dinas Brick Clay and Their Connection With the Modification of Its Strength 131-3-7/16

4.) As shown by experimental results, it is not of advantage to add dinas scrap, whereas high pressure and delayed burning in the interval 1300 - 1400° is of advantage for the production of a solid dinas.

There are 7 figures, 8 tables, and 23 references, 18 of which are Slavic.

ASSOCIATION: Khar'kov Institute for Refractories (Khar'kovskiy institut ogneuporov)

AVAILABLE: Library of Congress

Card 4/4 1. Refractory materials-Processing 2. Refractory materials-Properties-Tables

AUTHORS: Kaynarskiy, I. S., Shavrova, Ye. B. SOV/131-58-7-6/14

TITLE: Rules Governing the Change of the Elastic Properties of Dinas on Heating (Zakonomernosti izmeneniya uprugikh svoystv dinasa pri nagrevanii)

PERIODICAL: Ogneupory, 1958, V.23 Nr 7, pp 313 - 319 (USSR)

ABSTRACT: This paper determines the causes of the change of the shear modulus within the temperature interval of from 20 to 1500°. The angles of rotation at various temperatures were measured with a number of samples (Table 1). A considerable change of the shear modulus can be observed on the heating of the dinas to 800°, as is shown in figures 1,2 and 3, as well as in table 2. On a further heating to 1100° the shear modulus does almost not change at all, at temperatures above 1100° its decrease according to the rules begins. These changes depend on the additions, the specific weight as well as the formation of the liquid phase. Figure 4 shows the dependence of the decrease of the shearing modulus at 175° on the content of tridymite of the dinas, and figure 5 shows that at 250° on the content of cristobalite. Figure 6 shows the dependence of the decrease of the shear modulus at 200° on the content of quartz in the

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dinas. Table 3 gives the change of the shear modulus of the dinas within the temperature interval of from 25o-1ooo°. The dependence of the degree of increase of the shear modulus (in %), in the case of a heating above the inversion temperature on the content of silicon oxide of the dinas, can be seen from table 4. Figure 7 shows the dependence of the increase of the shear modulus (in %) at 8oo° on the total content of tridymite and cristobalite of the dinas. Table 5 gives the change of the shear modulus of the dinas on a heating within the interval of from 1ooo-15oo°. Conclusions:

1.- The decrease of the shear modulus of the dinas within the temperature interval of from 2o to 25o° is dependent on the changes of the modification of tridymite and cristobalite.

2.- The degree of the increase of the shearing modulus within the temperature interval of from 25o to 1ooo° depends on the content of additions.

3.- The decrease of the shear modulus of the dinas at above 1ooo° is dependent on the formation of the liquid phase. Up to a temperature of 15oo° dinas with a normal content of Al_2O_3

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has an elasticity which insures its performance in furnaces exposed to heavy work for a long time. There are 7 figures, 5 tables, and 4 references, 2 of which are Soviet.

ASSOCIATION: Khar'kovskiy politekhnicheskiy institut im. Lenina(Khar'kov Polytechnical Institute imeni Lenin)

1. Rock--Elasticity 2. Rock--USSR 3. Ceramic materials--Test results

AUTHORS: Kaynarskiy, I. S., Pindrik, B. Ye. SOV/131-58-8-3/12

TITLE: The Use of Dinas-Chromite in the Checkers of the Regenerators of Open-Hearth Furnaces (Primeneniye dinasokhromita v nasadkakh regeneratorov martenovskikh pechey)

PERIODICAL: Ogneupory, 1958, Nr 8, pp 351-360 (USSR)

ABSTRACT: The authors describe the results obtained by tests carried out with Dinas-chromite in the checkers of air- and gas-generators of open-hearth furnaces with basic roof arches. At the metallurgical plant imeni Voroshilov Dinas-chromite was tested in the regenerators of an open-hearth furnace of 220 t. Z. I. Kodryanskiy, M. P. Sabayev, and Ye. A. Ploshchenko took part in these tests (Ref 1). The temperature conditions of the air checkers are mentioned in table 1. An investigation carried out after the campaign showed that Dinas-chromite in the checker of the gas-regulator was in good condition. In the two checkers of the air-regulators its conditon was considerably worse, particularly in the three or four top rows. An advantage offered by this material compared to fireclay bricks is the fact that no deposits form on Dinas-chromite, whereas they attain a thickness of 25 mm on fireclay bricks. In the

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The Use of Dinas-Chromite in the Checkers of the Regenerators of Open-Hearth Furnaces

Stalino Metallurgical Plant experiments were carried out with Dinas-chromite in the checkers of the air-generators of a 120 t open-hearth furnace. Z. I. Kodryanskiy, S. A. Telesov, Ya. L. Troskunov, and L. E. Shekhova took part in the experiments (Ref 2). After 191 melts deposits of baked dust were discovered on the Dinas-chromite. The chemical composition of Dinas-chromite as well as of the deposits are given in table 3. Dinas-chromite showed less wear than Dinas (Table 4). The experiments carried out at the Stalino plant were extended and carried out in air- and gas-checkers. For this purpose Dinas-chromite industrially produced by the Dinas factory imeni Dzerzhinskiy was used. The temperature conditions prevailing during the operation of the upper part of the checkers are described by tables 5 and 6. In the air-checkers only the two or three top rows of Dinas-chromite were subjected to considerable wear. In the gas-checkers Dinas-chromite bricks were found to be in good condition. The amount of wear found with Dinas-chromite in checkers is given in table 7. At the Izhorsk plant Dinas-chromite bricks were tested in the checkers of air-regulators of the regenerators of a 75 t open-hearth furnace. Ye. A.

The Use of Dinas-Chromite in the Checkers of the Regenerators of Open-Hearth Furnaces

Volanskiy took part in this test (Ref 3). After the campaign, during which the checkers operated at temperatures of 1350 - 1440° during half the time, Dinas-chromite showed an amount of wear which is given in table 8. At the "Serp i molot" plant Dinas-chromite was tested in the air-checkers of a 70 t open-hearth furnace. L. I. Bernshteyn took part in this test (Ref 4). Temperature conditions prevailing in the upper parts of the checkers are described in table 9. The application of Dinas-chromite in the case of an aggressive action of melt-dust at temperatures of the order of 1400 - 1450° and more gave no positive results.

Conclusions: 1) Dinas-chromite does not overgrow, swell, or become loose, which is a considerable advantage in comparison to several other refractory materials. 2) Instead of Dinas, Dinas-chromite should be used for the checkers of open-hearth furnaces. 3) In open-hearth furnaces with magnesite-chromite arche roofs Dinas-chromite should be used in gas-checkers only at temperatures of up to 1350°, and in air-checkers only in the case of small quantities of dust. 4) It would be of advantage

The Use of Dinas-Chromite in the Checkers of the Regenerators of Open-Hearth Furnaces

to test Dinas-chromite in the checkers of the Cowper stoves in blast furnaces as well as in pit heating furnaces instead of Dinas.
There are 9 tables and 25 references, 25 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut ogneuporov (All-Union Scientific Research Institute for Refractories)

SOV/131-58-11-7/9

15(6)
AUTHORS: Kaynarskiy, I. S., Romanchenko, K. G., Pindrik, B. Ye.

TITLE: The Problem of Placing Unfinished Dinas Bricks on the Buggies of the Tunnel Kiln (K voprosu o sadke dinasovogo syrtsa na vagonetki tunnel'noy pechi)

PERIODICAL: Ogneupory, 1958, Nr 11, pp 521-526 (USSR)

ABSTRACT: When unfinished bricks of a size of 22,6 . 11,2 . 6,4 cm and an average weight of 3,5 kg are piled up while still wet, tensions are created by pressure, bending and compression. Tests revealed that unfinished dinas bricks have a sufficiently high compression limit to support the weight of a pile of unfinished bricks of a height of 1,6 m, which is, however, not true of their bending strength (Table 1). The compression strength of a regular pressed unfinished dinas brick corresponds to the specific pressure on the bottom row of bricks of a pile (Table 2). In order to obtain greater strength, the bricks were pressed with a pressure of approximately 400 kg/sq.cm after a sulphite-alcohol vinasse and the intensifier NB were added (Table 3). The results obtained in the laboratory were tested under industrial conditions in the Test Plant UNIIO as

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The Problem of Placing Unfinished Dinas Bricks on the Buggies of the Tunnel Kiln

well as in the **Krasnogorovskiy** and Zaporozhskiy Plants for Refractory **Materials** (Table 4). The results were tested in the Plant for Refractory **Materials** imeni Lenin as well as in the tsekh khromomagnezitovykh izdeliy Zaporozhskogo ogneupornogo zavoda (Department of Chrome Magnesite Products of the Zaporozhskiy Plant for Refractory **Materials**). Yu. P. Sidorenko, B. L. Gorfinkel', and P. I. Pazukha took part in the research (Ref 2). Regular bricks were piled up as in figure 1 and vault bricks as in figure 2. The results of sorting of these tests are shown in table 5.

Conclusions: it is possible to produce unfinished dinas bricks of sufficient strength; the greater strength is obtained by pressing at a pressure $\geqslant 350$ kg/sq.cm or by a combined addition of sulphite-alcohol vinasse and cast intensifier KB at usual pressure up to a specific weight of 2,23 - 2,25 g/cb.cm; unfinished dinas bricks of thus increased strength can be piled on the kiln buggy immediately away from the press; there is a possibility of drying the unfinished dinas bricks in the preheating zone of the tunnel kiln, which would make special

The Problem of Placing Unfinished Dinas Bricks on the Buggies of the Tunnel Kiln

drying unnecessary.
There are 2 figures, 5 tables, and 4 references, 2 of which are Soviet.

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov (Ukranian Scientific Research Institute of Refractory Materials)

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15(2) SOV/131-59-4-9/16

AUTHORS: Kaynarskiy, I. S., Orlova, I. G., Merkulova, Ye. V.

TITLE: The Pressing of Refractories Containing Graphite and Carborundum in Thermoplastic State (Pressovaniye grafit- i karborundsoderzhashchikh ogneuporov v termoplastichnom sostoyanii)

PERIODICAL: Ogneupory, 1959, Nr 4, pp 173-180 (USSR)

ABSTRACT: In the present paper the results of pressing graphite- and carborundum-containing masses are described which were made thermoplastic by means of additions of fireproof clay. The blanks were pressed by means of a unit which is presented in figure 1. Experiments with graphite KLZ-2 showed that it is possible to obtain first-rate products by pressing graphite-clay-containing masses in thermoplastic state (Table 1), especially when using ground graphite the structure was improved (Table 2). At an amount of pressure applied of 75 kh/cm^2 products of different density and porosity, depending on graphite content and pressure temperature, are obtained from graphitic-argillaceous masses (Table 3). The influence exerted by the graphite content of the masses upon the

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apparent porosity of the samples is presented in figures 2 and 3. The dependence of the breaking strength under pressure of the graphitic-argillaceous samples on the graphite content within the mass is demonstrated in figure 4. The interrelation between the breaking strength under pressure and the apparent porosity of graphitic-argillaceous samples are given in figure 5. The properties of graphitic-argillaceous refractories pressed in thermoplastic state at a temperature of 1300° are listed in table 4; figure 6 gives the model of a graphitic-argillaceous stopper for steel casting. Further carborundum-argillaceous refractories were investigated which were pressed in thermoplastic state at a temperature of 1300° and an amount of 100 kg/cm^2 of pressing applied (Table 5). The density and deformation of graphite-carborundum-argillaceous pressed refractories are presented in table 6 and their properties in table 7. Finally the authors of this article state that this pressing method has considerable advantages as compared with the method of hot pressing, which are based on various physico-chemical processes. There are 6 figures, 7 tables, and 1 Soviet reference.

The Pressing of Refractories Containing Graphite and Carborundum in Thermoplastic State SOV/131-59-4-9/16

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov (Ukrainian Scientific Research Institute of Refractories)

Card 3/3

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S/081/60/000/018/005/009
A006/A001

15.2130

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 18, pp. 363-364, # 74131

AUTHORS: Kaynarskiy, I. S., Malinovskiy, K. B.

TITLE: Molding of Thin Ceramic Articles by Electrophoresis

PERIODICAL: Tr. Khar'kovsk. politekhn. in-ta, 1959, Vol. 31, No. 1, pp. 59-69

TEXT: The authors studied technological problems of electrophoresis as a molding method. A special assembled installation was used to investigate the effect of the heating temperature of the dross, its concentration, pH and composition, the potential gradient of applied current voltage and current density on the intensity of deposition of the fine ceramic substance on the anode and on the quality of the accumulated body surface. Faience and porcelain dross were subjected to electrophoretic molding. The investigation showed that the electrophoretic speed of displacement of solid dross particles increases more intensively at a higher potential gradient of the applied voltage than the weight of the faience substance deposited on the anode. The rate of deposition of the substance

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Molding of Thin Ceramic Articles by Electrophoresis

decreases with time, in particular during the first 30 seconds. For both the faience and the porcelain dross the weight of the accumulated layer increases with a higher power supply at any temperature. A raise in the dross temperature and a higher concentration of solid particles during the supply of an equal amount of power entails a regular increase of the amount of substance deposited on the anode. Optimum conditions for obtaining high quality surfaces of articles by means of electrophoresis are: 35 - 40°C dross heating temperature; 3 - 5 v/cm gradient of the potential of voltage applied; 0.0035 - 0.0045 amp/cm^2 current density for faience dross and 0.003 - 0.006 amp/cm^2 for porcelain dross.

G. Gerashchenko

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

SOV/137-59-4-7408

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 4, p 10 (USSR)

15-2-00

AUTHORS: Kaynarskiy, I.S., Vasil'yeva, K.F.

TITLE: Technology of Preparing High-Quality Carborundum Refractories

PERIODICAL: Sb. nauchn. tr. Vses. n.-i. in-ta ogneuporov, Nr 2 (49), pp 319 - 355

ABSTRACT: The authors investigated properties of carborundum refractories produced with additions of 5 - 15% refractory clay, technical alumina or their mixture and also without mineral admixtures. A technology was developed for obtaining carborundum refractories containing 85% carborundum and more. These refractories are characterized by higher density, strength, resistance under load at high temperatures and heat resistance. Highest density of corundum refractories, pressed under 600 kg/cm^2 pressure, is obtained if the following fractions are contained in the carborundum mass (in mm): 40 - 50% of 0.6 - 0.4 fraction; 10 - 20% of 0.3 - 0.2 fraction; 40 - 50% of $<$ 0.06 fraction. Carborundum refractories roasted at 1,350° - 1,450°C have 12 - 18% porosity, σ_b compr. 700 - 1,200 kg/cm^2 they are highly heat resistant and at 1,750°C do not show deformations under a load of 2 kg/cm^2. However, only carborundum refractories, manufactured by semi-

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Technology of Preparing High-Quality Carborundum Refractories 69389 SOV/137-59-4-7408

dry or plastic pressing with organic gluey binding and without adding mineral admixtures, are oxide-resistant at high temperatures. They contain 84 - 88% SiC; their porosity is 15 - 19%, $\sigma_{b\ compr.}$ is 800 - 1,500 kg/cm^2, heat resistance is > 50 water heat changes. The described technology was used to develop mass production of carborundum sighting sleeves (vizirnyy stakan) and protective casings for thermocouples.

Ya.G.

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15 (2)

AUTHORS: Kaynarskiy, I. S., Degtyareva, E. V. SOV/131-59-9-6/12

TITLE: Practical Use and Wear of Refractory Carborundum Products

PERIODICAL: Ogneupory, 1959, Nr 9, pp 411-419 (USSR)

ABSTRACT: In this paper the authors report on the use of refractory carborundum products in various furnaces. The muffles in the furnaces for the burning of enameled utensils are composed of 28 plates with the following dimensions: 65×72×4.1 cm. There follows a detailed description of their utilization conditions and their modifications during use. Table 1 gives their content of silicon carbide, as well as the properties of the plates before and after their use in fusing the enamel. The furnaces for the regeneration of the skin are provided with muffles having a pusher. The muffles are heated by burners for blast furnace- or natural gas. Table 2 shows the composition of the gas. Figures 1 and 2 show carborundum muffles after 15-30 working days. Table 3 shows the chemical analyses, the porosity, and the specific weight of the muffles before and after use. For the platinumrhodium-platinum thermocouples protecting carborundum coatings are used. Table 4 contains the description of the carborundum tubes after their use. The investigations showed

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that the chief modification of the refractory carborundum products consists in the oxidation of silicon carbide according to the reaction $2\ SiC + 3\ O_2 = 2\ SiO_2 + 2\ CO$. This oxidation process causes a doubling of the carborundum volume, as may be seen from figure 3. In conclusion it is said that the refractory carborundum products are chiefly oxidized by gases with high steam content. This oxidation causes a considerable expansion of the carborundum products and thus a strong increase of the volume. This leads to the formation of cracks and the destruction of the walls. Hence, when erecting the walls joints of appropriate dimensions should be provided. There are 5 figures, 4 tables, and 7 references, 3 of which are Soviet.

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov (Ukrainian Scientific Research Institute for Refractories)

KAYNARSKIY, I.S.; SHAVROVA, Ye.B.

Interrelation of the stability and elasticity of Dinas brick. Mat. Trudy KhPI. 31 no.1:37-42 '59. (MIRA 13:10)
(Firebrick)

15 (2)

S/131/60/000/02/007/014
B015/B008

AUTHORS: Kaynarskiy, I. S., Degtyareva, E. V.

TITLE: Oxidizability of Refractory Carborundum Products and Methods for Its Reduction

PERIODICAL: Ogneupory, 1960, Nr 2, pp 77-84 (USSR)

ABSTRACT: The authors investigated the possibility of reducing the oxidizability of refractory carborundum products. The samples produced for this purpose were oxidized in a Kryptol furnace (Fig 1). The dependence of the degree of oxidation on the grain of the carborundum masses, the permeability to gas and the porosity of the products can be seen from figures 2-6 and tables 1-5. The clay content in carborundum products reduces their stability, as shown in table 6 and figures 7 and 8. An additive of 10% ferrosilicon or 3% $Ba(OH)_2$ reduces the oxidizability of carborundum (Table 7), the ceramic properties of the products are not altered thereby (Table 8). The influence of the saturation of carborundum samples by solutions of aluminum-, magnesium-, calcium- and alkali phosphates can be seen from figure 9 and table 9. The oxidation of carborundum bricks without an additive, with an additive of 10% Fe, 3%

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Oxidizability of Refractory Carborundum Products and Methods for Its Reduction

S/131/60/000/02/007/014
B015/B008

$Ba(OH)_2$, and on saturation by phosphates under direct flame action is mentioned in tables 10 and 11. It is stated in conclusion that the oxidizability of carborundum products is reduced with the reduction of the porosity and permeability to gas. By improving the grain of refractory carborundum products without mineral additives, the oxidizability is reduced at high temperatures and increased at relatively low ones. An additive of 10% ferrosilicon and 3% barium hydroxide reduces the oxidizability of the products. An additive of clay furthers the reduction of the oxidation of carborundum products at temperatures of up to 1250-1350° and the increase of their oxidizability at 1450-1600°. By impregnating burnt refractory carborundum products with solutions of silicon ethyl ester and phosphates, the oxidizability of the products is reduced. Carborundum products are preserved against oxidation by coating with an alumina-containing vanadium alloy. There are 10 figures, 11 tables, and 14 references, 5 of which are Soviet.

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov (Ukrainian Scientific Research Institute of Refractories)

Card 2/2

S/081/61/000/002/009/023
A005/A105

Translation from: Referativnyy zhurnal, Khimiya, 1961, No. 2, p. 333, # 2K231

AUTHORS: Kaynarskiy, N.S., Degtyareva, E.V.

TITLE: Dinas Carborundum and Its Properties

PERIODICAL: "Sb. nauchn. tr. Ukr. n.-i. in-t ogneuporov", 1960, No. 3(50), pp. 185 - 201

TEXT: The authors give results from an investigation of technology and properties of Dinas Carborundum which is distinct from the ordinary Dinas by high thermal stability. A peculiarity of Dinas Carborundum technology is the application of 30% milled carborundum to the composition of the mixture and addition of 1% CaO.

From the authors' summary

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

29427
S/081/61/000/017/079/166
B101/B102

15 2630

AUTHORS: Kaynarskiy, I. S., Degtyareva, E. V.

TITLE: Thermal stability of refractories

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 17, 1961, 335, abstract 17K207 (Sb. nauchn. tr. Ukr. n.-i. in-t ogneuporov, no. 4, 1960, 5-17)

TEXT: It was experimentally proved that the thermal stability of Dinas carborundum, magnesite-chromite, and magnesite spinel refractories is a regular, quantitative, reciprocal function of their thermal conductivity. The microfissure structure is of decisive importance for ensuring thermal stability. It can be attained by employing various industrial processes, e.g., by using two-phase or multi-phase mixtures. [Abstracter's note: Complete translation.]

X

Card 1/1

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S/131/60/000/04/06/015
B015/B008

15.2220

AUTHORS: Kaynarskiy, I.S., Degtyareva, E.V., Kukhtenko, V.A.

TITLE: Carborundum Products With Silicon Nitride Bond

PERIODICAL: Ogneupory, 1960, No. 4, pp. 175-180

TEXT: The properties of these carborundum products are investigated and described by the authors in the paper under review. Silicon-nitride (Si_3N_4) melts at 1900° and may be used as refractory material. Its strength scarcely changes in the temperature range of from 20 - 1200°. A number of patents has been granted lately for the use of silicon-nitride as bond for the manufacture of high-quality carborundum refractories. The charge composition and the properties of the carborundum samples with silicon-nitride bond are mentioned in table 1. In the course of the determination of refractoriness, the pyroscope of metallic silicon was deformed at a temperature of 1680° and that of a sample of 100% technical silicon, previously nitrated at 1500°, at over 1900° (Fig. 1). The properties of the samples are compared in table 2. The influence of the carborundum granulation and of the amount of silicon on the ceramic properties of the samples may be seen from table 3. The thermal expansion of the carborundum

Card 1/2

87133

S/131/60/000/012/003/003
B021/B058

18.6100

AUTHORS: Kaynarskiy, I. S., Degtyareva, E. V., and Kukhtenko, V. A.

TITLE: Hot-pressed Ultradense Products of Carborundum

PERIODICAL: Ogneupory, 1960, 25 No. 12, pp. 562-566

TEXT: The authors carried out hot-pressing on an installation designed by the Institut metallokeramiki i spetsial'nykh splavov AN USSR (Institute of Powder Metallurgy and Special Alloys AS UkrSSR). Experiments showed that an addition of 20% boron results in a considerable increase of density (Table 1) when pressing the carborundum at 2200°C. The porosity is still high at a pressure of 100 kg/cm^2 and a temperature of 2000°C (Table 2). Reducing the pressure below 100 kg/cm^2 leads to an increase in porosity (Table 3). The compression of the samples continues during temperature increase under pressure (Table 4). A reduction of the boron addition to 10% scarcely alters the density of the samples (Table 5). The influence of the introduction of large carborundum granules on the density of hot-pressed samples at a pressure of 100 kg/cm^2, a temperature of 2140° - 2170°C, and a duration of 5 min is illustrated in Table 6. The properties

Card 1/2

S/081/62/000/010/063/085
B168/B180

AUTHORS: Degtyareva, E. V., Kukhtenko, V. A., Kaynarskiy, I. S.

TITLE: On the recrystallization of silicon carbide in manufactured articles fired at high temperature under reducing conditions

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 10, 1962, 415, abstract 10K214 (Sb. nauchn. tr. Ukr. n.-i. in-t ogneuporov, no. 5(52), 1961, 92 - 107)

TEXT: It was established that high-temperature firing under reducing conditions brings about a slight decrease in the volume of a body together with a substantial increase in its porosity, which in recrystallized carborundum articles is extremely high; this is due to evaporation of SiC. The optimum conditions for the manufacture of recrystallized carborundum articles were found to be as follows: granular composition (in %) 0.9 - 0.7 mm 50 - 60, 0.3 - 0.2 mm 0 - 10, < 0.06 mm 40; compacting pressure 500 kg/cm^2; recrystallization temperature 2170 - 2200°C; soaking > 1 hr. Under optimum conditions recrystallized articles were obtained with a porosity of 23 - 25% and with the addition of 20 - 22% boron

Card 1/2

ROMANCHENKO, K.G.; KAYNARSKIY, I.S.

Strength of green Dinas bricks and its determinative factors. (MIRA 14:2)
Ogneupory 26 no.1:31-41 '61.

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov.
(Firebrick--Testing)

KAYNARSKIY, I.S.; ORLOVA, I.G.; MERKULOVA, Ye.V.

Thermoplastic pressing of common clay and kaoline bricks.
Ogneupory 26 no. 2:71-80 '61. (MIRA 14:2)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov.
(Firebrick)

KAYNARSKIY, I.S.; ORLOVA, I.G.; MERKULOVA, Ye.V.

Properties of hot-pressed refractories on a basis of clay and kaolin. Sbor.nauch.trud. UNIIO no.5:79-91 '61. (MIRA 15:12)
(Firebrick)

ROMANCHENKO, K.G.; KAYNARSKIY, I.S.

Interaction of calcium monoxide with silicon dioxide during the blending of Dinas substances. Ogneupory 26 no.3:143-148 '61. (MIRA 14:4)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov. (Firebrick)

KAYNARSKIY, I.S.; DEGTYAREVA, E.V.

Carborundum refractory materials for furnaces which reduce iron slag and convert natural gas. Ogneupory 26 no.7:322-328 '61. (MIRA 14:7)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov.
(Silicon carbide)
(Furnaces, Heat treating)

KAYNARSKIY, I.S.

Technological problems in the automation of Dinas production. Ogneupory 26 no.9:409-414 '61. (MIRA 14:9)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov. (Firebrick)

KAYNARSKIY, I.S.; DEGTYAREVA, E.V.; KUKHTENKO, V.A.

Technology of a dust-free, granulated, moisture-absorbing dinas mortar. Ogneupory 27 no.2:53-59 '62. (MIRA 15:3)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov.
(Fireclay) (Mortar)

KAYNARSKIY, I.S.; ORLOVA, I.G.; PROKOPENKO, M.I.; SOKHNA, G.Ye.; YEVDOKIMOV, Yu.P.

Testing of zircon dinas bricks in the arches of steel-smelting arc furnaces. Ogneupory 27 no.2:77-80 '62. (MIRA 15:3)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov (for Kaynarskiy, Orlova, Prokopenko). 2. Khar'kovskiy traktornyy zavod im. Ordzhonikidze (for Sokha, Yevdokimov).
(Firebrick--Testing) (Electric furnaces)

KAYNARSKIY, I.S.; ORLOVA, I.G.

Grog-free refractories made of high-grade clays and kaolins.
Ogneupory 27 no.10:444-449 '62. (MIRA 15:9)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov.
(Refractory materials)

KAYNARSKIY, I.S.

Contributions of science to the production of refractory materials. Ogneupory 27 no.11:494-498 '62. (MIRA 15:11)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov.
(Refractory materials—Research)

34483
S/020/62/142/004/021/022
B101/B110

15.2240

AUTHORS: Kaynarskiy, I. S., and Karyakin, L. I.

TITLE: Mineral formation by contact between silicon carbide and ferric and calcium oxide

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no. 4, 1962, 887 - 889

TEXT: The cause of destruction of carborundum refractories (CR) by contact with iron scale or CaO at 1600°C was investigated. CR were prepared by a method described earlier (Sborn. nauchn. tr. Vses. nauchno-issl. inst. ogneuporov, no. 2 (49), 319 (1958)). They consisted of 0.7 - 0.5 mm carborundum grains, a cement mass of small carborundum grains, a glass-like mass, and anisotropic grains (N≈1.534) with slight birefringence, probably nephelin. CR cylinders (h = 75 mm, d = 50 mm) were bored out (h and d of the cavity, 25 mm), filled with iron scale or CaO, and heated for 12 hr in air at 1600°C. (1) Slight corrosion set in with iron scale. The cavity contained a black, porous, slag-like mass which consisted of magnetite, β-cristobalite, and some hematite. The cristobalite had formed partly from SiO_2 grains contained in the scale and partly by oxidation of SiC.

Card 1/3

S/020/62/142/004/021/022
B101/B110

Mineral formation by contact...

The scale consisting of 80% FeO, melts, oxidizes, and turns into magnetite and partly into hematite. These oxides react more weakly with SiC than FeO. This explains the low destructive effect of the scale. (2) Intensive destruction set in with CaO. In a 5 - 8 mm thick transition zone, the number of carborundum grains had slightly decreased, and some glass-like substance had formed. In the outer zone, a decrease of the number of small carborundum grains and corrosion of the large ones occurred under formation of pores. The inner wall was covered with a porous, white crust of about 10 mm thickness, consisting of β-cristobalite and a glass-like substance (N ~1.510 - 1.515). On the outer wall, the β-cristobalite was acicularly crystallized, and pseudo-wollastonite was found. The low N of the glass-like substance suggests low Ca content, since glass corresponding to the composition $CaSiO_3$ ought to have an N of ~ 1.628.

$CaSi_2$ and Ca_2C were not found. With CaO, CR with 10% ferrosilicon showed the same corrosion phenomena, but more pseudo-wollastonite had formed. Simultaneous action of FeO and CaO increased corrosion. There are 1 table and 8 references: 6 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: R. J. Scace, G. A. Slack, Silicon Carbide, 1960, p. 24; E. Guy, J. Am. Ceram. Soc., 41, 347 (1958).

Card 2/3

S/080/63/036/001/025/026
D204/D307

AUTHORS: Kaynarskiy, I.S. and Degtyareva, E.V.

TITLE: Mineralizers for reactions between solid phases

PERIODICAL: Zhurnal prikladnoy khimii, v. 36, no. 1, 1963, 225 - 227

TEXT: Synthesis of compounds from solid phases should be accelerated by compounds giving a melt containing a cation common to a reactant; suitable compounds are e.g. inorganic salts which possess a m.p. lower than the reaction temperature. This was tested on reactions of the formation of $MgCr_2O_4$, $MgAl_2O_4$, and $CaAl_2O_4$ form the oxides, using $MgCl_2$ and MgF_2 for the first 2 reactions and $CaCl_2$ for the 3rd. NaCl was also added in each case. $MgCl_2$ additions increased the yield of $MgAl_2O_4$ (at 1000°C), from 55.5 to 75.4 % after 6 hrs; a less pronounced effect (yield 70 %) was observed with MgF_2. No such effects were observed with NaCl. Corresponding effects were observed with $MgCr_2O_4$, although the

Card 1/2

L 15697-63 EWP(k)/EWP(q)/EWT(m)/BDS AFFTC/ASD Pf-4

AUTHOR: Kaynarskiy, [illegible] S., Degtyareva, E. V.

TITLE: [illegible] of silicon carbide at [illegible] temperatures

CITED SOURCE: Tr. [illegible] Soveshchaniya po eksperim. i tekhn. mineralogii i petrogr., [illegible], AN SSSR, [illegible]

27 21

TOPIC TAGS: SiC, recrystallization, silicon carbide

TRANSLATION: In high-temperature heating under reducing conditions in extrusions from silicon carbide, a series of processes takes place: loss of weight as a result of [illegible] and, possibly, partial decomposition [illegible] of porosity of the body as a result of a loss [illegible] decrease [illegible] the [illegible], occurring as a consequence of some caking [illegible] recrystallization and recrystallization of SiC. The result of these processes is the formation of a body with porosity somewhat higher than the porosity of the initial [illegible] tration, but with the simultaneous acquisition by the body of sufficient [illegible]

Card 1/2

L 15687-63

ACCESSION NR: [illegible]

It was [illegible] excessive increase in the temperature of [illegible] [illegible] magnesia [illegible] [illegible] sharply increased porosity. For lowering porosity [illegible] crystallization roasting, neither the use of various charges nor [illegible] of the pressure of extrusion above 500 kg/sq cm was successful. [illegible]

14

DATE ACQ: 12Jun63 SUB CODE: CH, ML ENCL: 00

Card 2/2

KAYNARSKIY, I.S.

PHASE I BOOK EXPLOITATION SOV/6379

Kaynarskiy, Il'ya Semenovich, and Eleonora Vladimirovna Degtyareva

Karborundovyye ogneupory; svoystva karbida kremniya, tekhnologiya, svoystva i primeneniye karborundovykh ogneuporov (Carborundum Refractories; Properties of Silicon Carbide, Technology, Properties and Application of Carborundum Refractories) Khar'kov, Metallurgizdat, 1963. 251 p. 3050 copies printed.

Ed. of Publishing House: Ye. K. Sinyavskaya; Tech. Ed.: G. P. Obukhovskaya.

PURPOSE: This book is intended for engineers and technicians working in the refractory, metallurgical, ceramic, and chemical industries, and for scientists and students interested in silicates.

COVERAGE: The book, representing a review of the field and based primarily on periodical literature, gives a systematic presentation of information on the physicochemical properties of carborundum, the technology of carborundum production, the

Card ~~1/3~~ 1/2

Carborundum Refractories (Cont.) SOV/6379

manufacture of carborundum refractories with ceramic binders, various types of refractories containing carborundum, and specialized carborundum products (recrystallized, hot-pressed, self-binding) with silicon nitride binder and other binders. Industrial applications of carborundum refractories are also given. There are 397 references: 170 of them Soviet.

TABLE OF CONTENTS [Abridged]:

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EWP(q)/EWT(m)/BDS--AFFTC/ASD--WH
L 11222-63
ACCESSION NR: AP3000025 S/0131/63/000/005/0218/0223

AUTHOR: Kaynarskiy, I. S.; Gaodu, A. N.

TITLE: Light-weight refractory products of corundum

SOURCE: Ogneupory, no. 5, 1963, 218-223

TOPIC TAGS: refractories, corundum, bloating, gypsum, spinel, calcium, aluminate, magnesium, alumina

ABSTRACT: The authors found it possible to prepare effective light-weight refractory products from commercial unground and finely ground alumina without preliminary roasting. This is accomplished by bloating with gas, using the powdered alumina with hydrated calcium oxide in the presence of water. Gypsum is added to strengthen the bloated casting, and caustic magnesite is added to lower the roasting temperature and to increase the strength of the final product. The bulk weight and thermal conductivity of the product are low. Fire resistance is [illegible] and initial deformation does not occur till 1590C. The mineral phase in the refractory is chiefly corundum, with subordinate magnesian spinel and calcium aluminate. Orig. art. has: 6 tables and 4 figures.

Card 1/2

Ukrain Sc. Research Inst. for Refractories

KAYNARSKIY, I.S.; DEGTYAREVA, E.V.; YELTYSHEVA, A.A.

Unfired dinas bricks. Ogneupory 28 no.7:303-305 '63.
(MIRA 16:9)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov.

KAYNARSKIY, I.S.; DEGTYAREVA, E.V.

Mineralizers of reactions between solid phases. Zhur.prikl.khim. 36 no.1:225-227 Ja '63. (MIRA 16:5)
(Fused salts) (Phase rule and equilibrium)

ACCESSION NR: AP4040465 S/0131/64/000/006/0270/0275

AUTHORS: Gaodu, A. N.; Kaynarskiy, I. S.

TITLE: Study of swelling kinetics in the alumina dross used in production of lightweight corundum refractories

SOURCE: Ogneupory*, no. 6, 1964, 270-275

TOPIC TAGS: refractory, corundum refractory, dross, dolomite, gypsum, alumina, coke powder, orthophosphoric acid, porosity regulation, viscosity, fluidity, hardening, dextrin, vinasse

ABSTRACT: Results of a study involving the kinetics of dross swelling under various conditions are presented. Procedures and instruments used were described previously by the authors (Ogneupory*, 1963, No. 5). Reactions between dolomite (in gypsum) and orthophosphoric acid were used for the porosity regulation in raw material consisting of aluminum oxides, gypsum, and small admixtures of powdered coke. It was found that pore sizes increased with the increase of gypsum and acid. This relation persisted after the introduction of powdered coke, which resulted in a weight decrease and the general increase of structural uniformity. Weight

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ACCESSION NR: AP4040465

decrease was also achieved with the use of surface-active substances (dextrin, sulfite-vinasse) which served to improve dross fluidity. The swelling process was found to be related to the amount of phosphoric acid, the carbonate (dolomite) composition, the amount of gypsum, water content and water temperature. These relations are expressed graphically in Figs. 1, 2, 3, 5, and 6 of the Enclosures. The variation in the apparent dross viscosity with temperature (in the process of swelling) is shown in Fig. 4 of the Enclosures. The variations in gas pressures within pores with respect to dross temperature and to moisture content are shown in Figs. 7 and 8 of the Enclosures. It was determined that the progress of dross swelling varied with many factors and physicochemical conditions, and was determined by several continuous processes. These processes could be regulated by adding substances which affect the setting time of gypsum. Dextrin may be used to slow down the setting of gypsum, while $CaSO_4 \cdot 2H_2O$ and H_2SO_4 serve as accelerators. The effect of these agents on the dross volume increase is illustrated in Fig. 9 of the Enclosures. Basic indexes of the light-weight refractories produced under optimal conditions were: Al_2O_3 content of 88-90%, thermal resistivity above 1900C, specific gravity of 0.82-0.90 g/cm^3, porosity of 72-79%, ultimate compressive strength of 26-45 kg/cm^2, thermal conductivity coefficient (in the temperature range 20-1400C) of 0.44 kcal/m·hour·degree. The product consisted of corundum with smaller amounts

Card 2/3

ACCESSION NR: AP4040465

of calcium and aluminum phosphates and of calcium aluminate. Orig. art. has: 3 tables and 13 figures.

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov (Ukrainian Scientific Research Institute of Refractories)

SUBMITTED: 00 DATE ACQ: 06Jul64 ENCL: 05

SUB CODE: MM NO REF SOV: 004 OTHER: 000

Card 3/3

DEGTYAREVA, E.V.; KAYNARSKIY, I.S.

Kinetics of corundum caking. Dokl. AN SSSR 156 no. 4:937-940 Je '64. (MIRA 17:6)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov. Predstavleno akademikom N.V.Belovym.

ORLOVA, I.G.; KAYNARSKIY, I.S.

Kinetics of the deformation of corundum specimens on heating. Dokl. AN SSSR 157 no. 2:331-333 Jl '64. (MIRA 17:7)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov. Predstavleno akademikom N.V.Belovym.

KAYNARSKIY, I.S.; DEGTYAREVA, E.V.; PINDRIK, B. Ye.; KUKHTENKO, V.A.; KULAKOV, N.I.; BEL'CHENKO, B.I.; IVNITSKAYA, N.S.; SMORODA, I.M.; SHAROV, M.F.; KOZIN, L.M.; KVASHA, A.S.; PELESHCHUK, M.I.; PRYAKHIN, L.G.; LEVINA, L.I.; DANILOV, V.I.; DIDENKO, S.Yu. PROTSENKO, G.A.

Reducing dust formation from dinas bricks and dinas mortar. Ogneupory 29 no.3:109-112 '64 (MIRA 17:3)

1. Ukrainskiy nauchno-issledovatel'skiy institut ogneuporov (for Kaynarskiy, Degtyareva, Pindrik, Kukhtenko). 2. Gosudarstvennyy institut po proyektirovaniyu predpriyatiy koksokhimicheskoy promyshlennosti (for Kulakov, Bel'chenko, Ivnitskaya). 3. Vsesoyuznyy trest po stroitel'stvu i montazhu koksokhimicheskikh zavodov (for Peleshchuk, Pryakhin, Levina). 4. Ukrainskiy nauchno-issledovatel'skiy institut gigiyeny truda i professional'nykh zabolevaniy (for Danilov, Didenko, Protsenko).